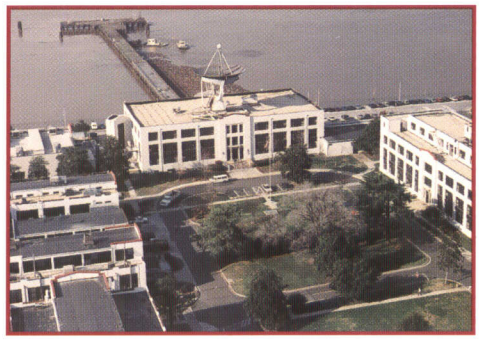
Naval Research Laboratory

Washington, DC 20375-5320 NRL/PU/5230--95-275 July 1995

1994-95 FACT BOOK



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The NRL Fact Book is prepared as a reference source for information about the Naval Research Laboratory (NRL). Fiscal information, personnel, and organization changes are current as of 25 June 1995. To provide additional information to the reader, a point of contact is listed for each activity.

NRL has a continuing need for physical scientists, mathematicians, engineers, and support personnel. Vacancies are filled without regard to age, race, creed, sex, or national origin. Information concerning current vacancies is furnished on request. Address all such inquiries to:

Human Resources Office
Staffing Branch (Code 1810)
Naval Research Laboratory
Washington, DC 20375-5320

On the cover - top to bottom

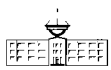
The Naval Research Laboratory, Washington, DC, is located on the banks of the Potomac River.

A specially configured NP-3D from NRL's Flight Support Detachment, Naval Air Warfare Center, Patuxent River, Maryland. This NP-3D is flying over NRL's Chesapeake Bay Detachment, Chesapeake Beach, MD.

Radar test site at Building 75, Chesapeake Bay Detachment, Chesapeake Beach, Maryland, showing radar antennas used in various experiments by the Radar Division. See related photo on p. 62.

Aerial view of the Atmospheric Research Laboratory located at Stennis Space Center, Bay St. Louis, Mississippi (NRL-SSC).

The Naval Oceanographic and Atmospheric Research Laboratory is located in Monterey, California (NRL-MRY).



Quick Reference Telephone Numbers

	NRL WASHINGTON	NRL-SSC	NRL-MONTEREY	NRL CBD
Hotline	(202) 767-6543	(601) 688-5001	(408) 656-4737	(202) 767-6543
Personnel Locator	(202) 767-3200	(601) 688-3390	(408) 656-4706	(410) 257-4000
DSN	297- or 354-	485	878	—
Direct-in-Dialing	767- or 404-	688	656	257
Public Affairs	(202) 767-2541	(601) 688-5328	(408) 656-4708	—

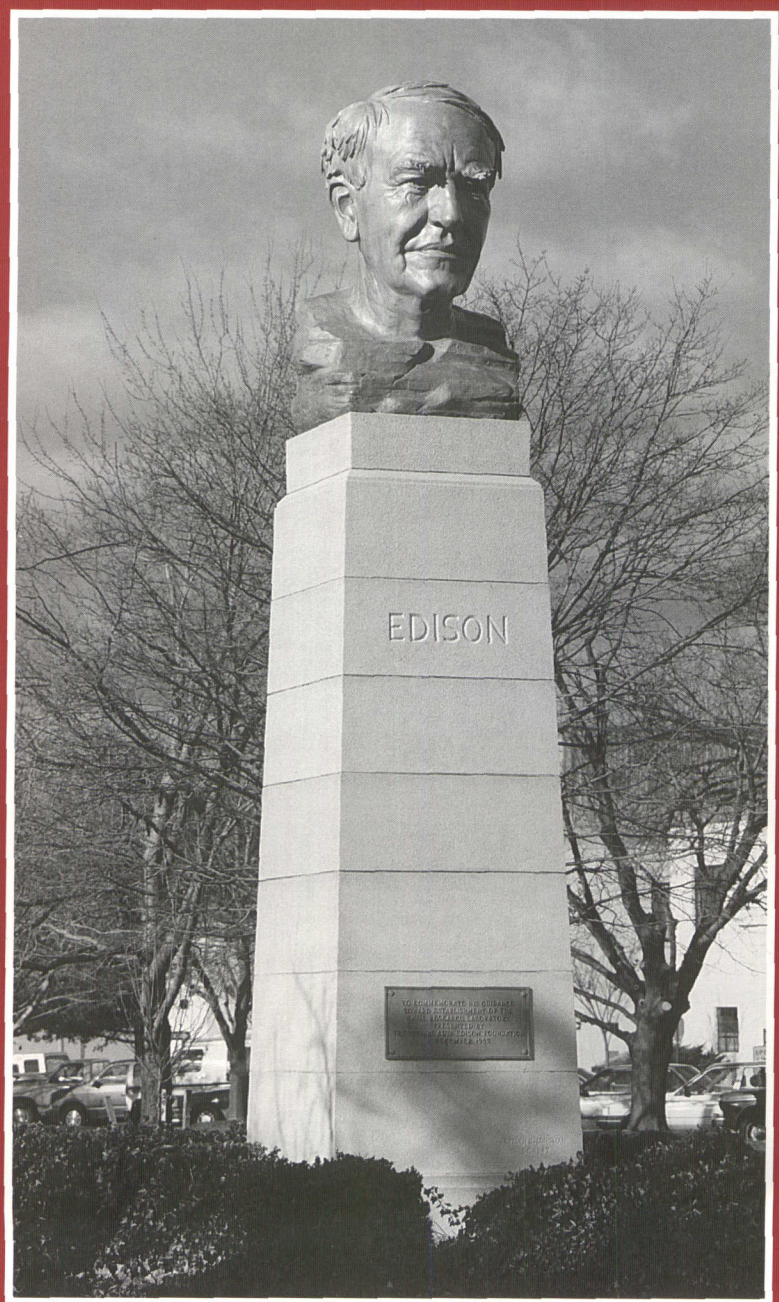
Additional telephone numbers are listed on pages 148 and 149.

1994-95 FACT BOOK

NAVAL RESEARCH LABORATORY
WASHINGTON, DC 20375-5320

Contents

Introduction to the Naval Research Laboratory



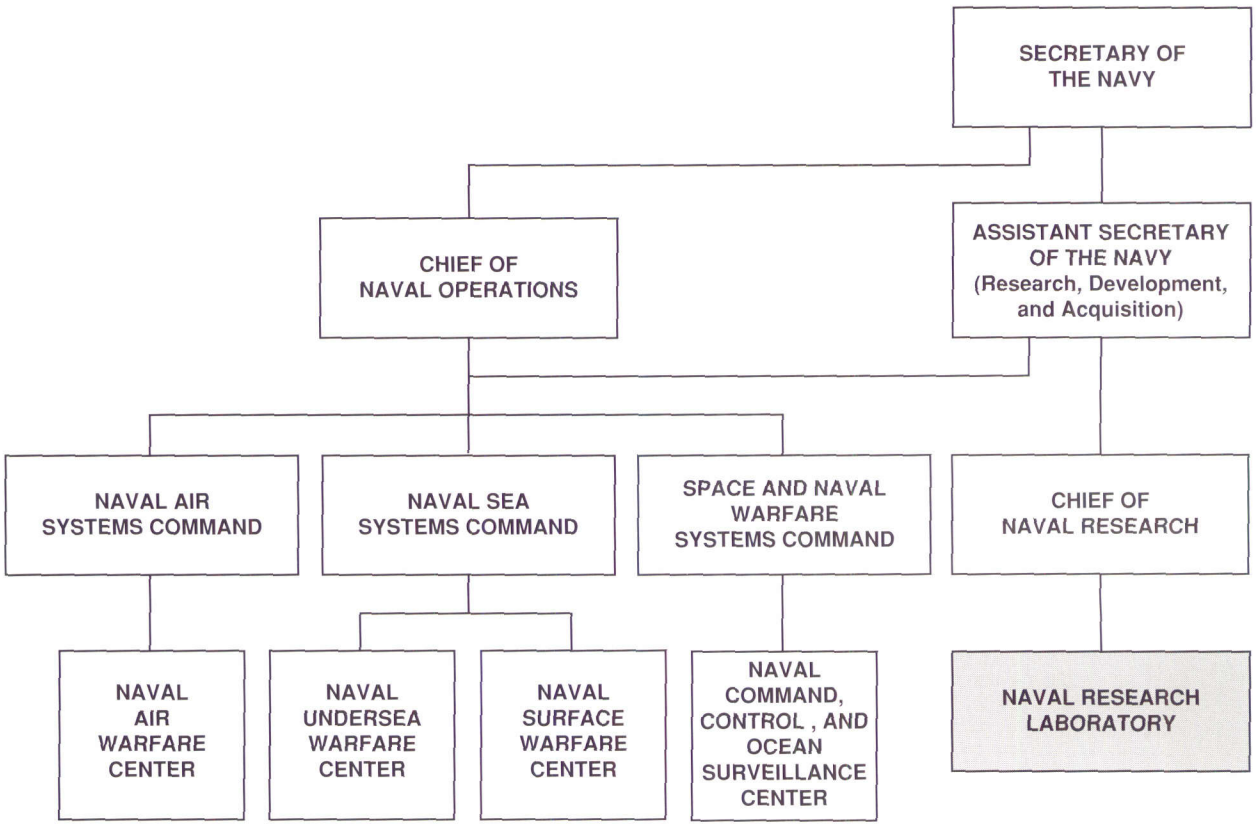
Mission

To conduct a broadly based multidisciplinary program of scientific research and advanced technological development directed toward maritime applications of new and improved materials, techniques, equipment, systems, and ocean, atmospheric, and space sciences and related technologies.

The Naval Research Laboratory provides

- Primary in-house research for the physical, engineering, space, and environmental sciences
- Broadly based exploratory and advanced development programs in response to identified and anticipated Navy needs
- Broad multidisciplinary support to the Naval Warfare Centers
- Space and space systems technology development and support


DEPARTMENT OF THE NAVY
UNITED STATES OF AMERICA


SECRETARY OF THE NAVY
CHIEF OF NAVAL OPERATIONS
ASSISTANT SECRETARY OF THE NAVY (Research, Development, and Acquisition)
NAVAL AIR SYSTEMS COMMAND
NAVAL SEA SYSTEMS COMMAND
SPACE AND NAVAL WARFARE SYSTEMS COMMAND
CHIEF OF NAVAL RESEARCH
NAVAL AIR WARFARE CENTER
NAVAL UNDERSEA WARFARE CENTER
NAVAL SURFACE WARFARE CENTER
NAVAL COMMAND, CONTROL , AND OCEAN SURVEILLANCE CENTER
NAVAL RESEARCH LABORATORY

The Naval Research Laboratory in the Department of the Navy

The Naval Research Laboratory is the Department of the Navy's corporate laboratory; it is under the command of the Chief of Naval Research (CNR). As the corporate laboratory of the Navy, NRL is an important component in the Office of Naval Research's effort to meet its science and technology responsibilities.

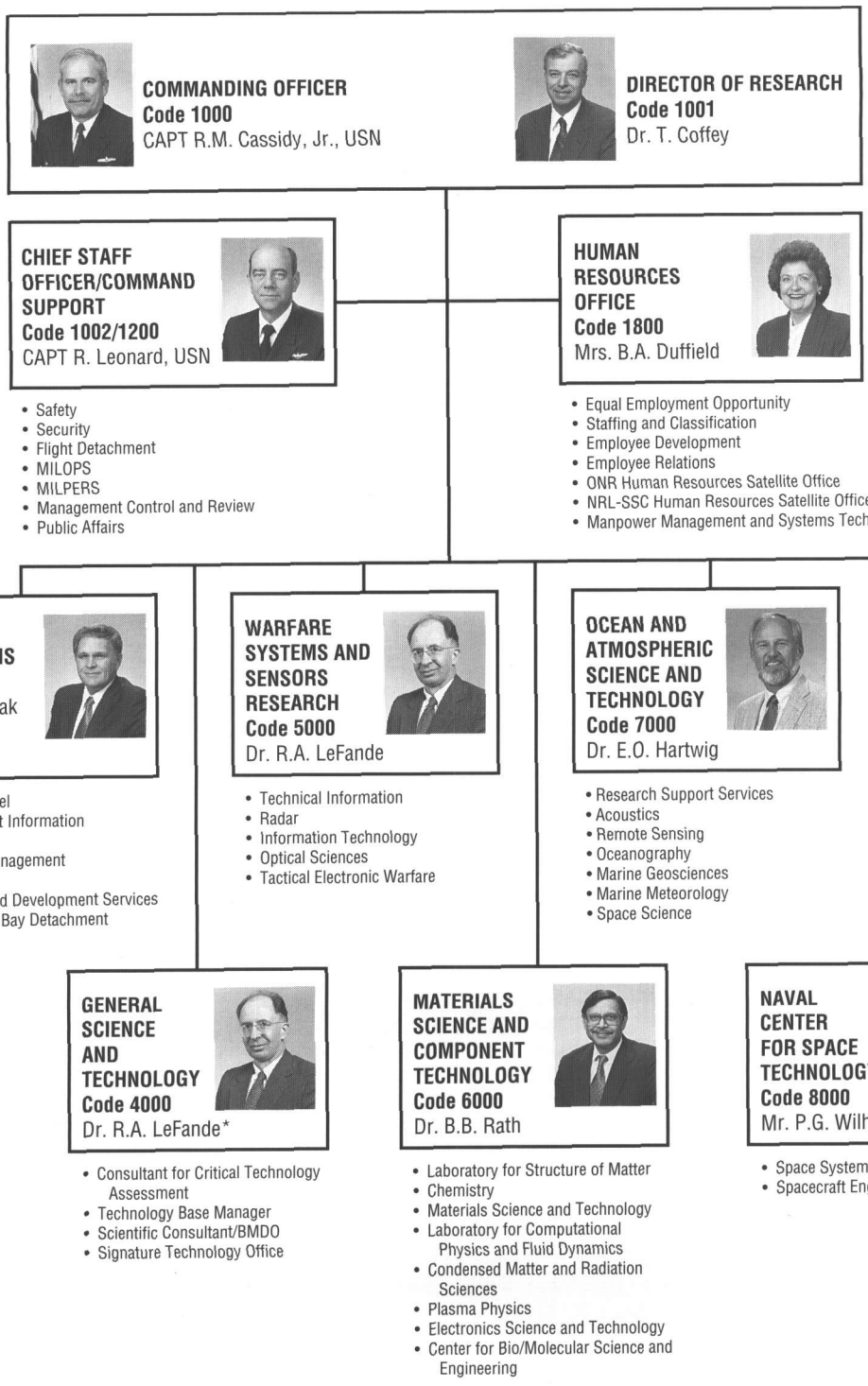
For its basic research effort, the Laboratory receives guidance from the CNR that establishes the level of effort and trend direction. The Laboratory then develops a comprehensive research proposal package that is submitted to the CNR for consideration for Navy basic research support. The total Navy basic research program ultimately is evaluated by Congress.

In addition to internal critical review and the evaluation by the CNR and others, the research at NRL is published in refereed journals and/or reported at national and international scientific conferences. There is an aggressive policy of scientific interaction whereby scientists from around the world visit NRL and are visited by NRL scientists. In this way, NRL research is subject not only to management review but also to peer evaluation.

NRL has had a long and fruitful relationship with industry as a collaborator, contractor, and most recently in Cooperative Research and Development Agreements (CRADA). NRL values this linkage and intends for it to continue to develop.

NRL is an important link in the Navy R&D chain. Through NRL, the Navy has direct ties with sources of fundamental ideas in industry and the academic community throughout the world and provides an effective coupling point to the R&D chain for the Office of Naval Research (ONR).

NRL Functional Organization



*Additional duty

Current Research

The following areas represent broad fields of NRL research. Under each, more specific topics that are being investigated for the benefit of the Navy and other sponsoring organizations are listed. Some details of this work are given in the *NRL Review*, published annually. More specific details are published in reports on individual projects provided to sponsors and/or presented as papers for professional societies or their journals.

Advanced Radio, Optical, and IR Sensors

- Advanced optical sensors
- EO/MET sensors
- Satellite meteorology
- Precise space tracking
- Radio/Infrared astronomy
- Infrared sensors and phenomenology
- Middle atmosphere research
- Image processing
- VLBI/Astrometry
- Atmospheric effects on low frequency EM communications
- Optical interferometry
- Imaging spectrometry

Computer Science and Artificial Intelligence

- Standard computer hardware, development environments, operating systems, and run-time support software
- Methods of specifying, developing, documenting, and maintaining software
- Human-computer interaction
- Intelligent systems for resource allocation, signal identification, operational planning, target classification, and robotics
- Algorithms and utilization of massively parallel computing systems
- Visualization of scientific processes
- High-performance networking
- Machine learning
- Advanced computer networking

Electronic Electro-optical Device Technology

- Integrated optics
- Radiation-hardened electronics
- Microelectronics
- Microwave and MM wave technology
- Hydrogen masers for GPS
- Aperture syntheses
- Electric field coupling
- Vacuum electronics

Directed Energy Technology

- High-energy lasers
- Chemical lasers
- Laser propagation
- High-power microwave sources
- Charged-particle devices
- Pulse power
- DE effects

Electronic Warfare

- EW/C2W/IW systems and technology
- COMINT/SIGINT technology
- EW decision aids, and planning/control systems
- Intercept receivers, signal processing, and identification systems
- Passive direction finders
- Decoys and offboard CM (RF and IR)
- Expendable autonomous vehicles
- Repeaters/jammers and EO/IR active countermeasures and techniques
- Platform signature measurement and management
- Threat and EW systems computer modeling and simulations
- Visualization and virtual reality
- Hardware-in-the-loop and flyable simulators
- Rf environment simulators

Enhanced Maintainability, Reliability, and Survivability Technology

- Coatings
- Lubricants and greases
- Water additives and cleaners
- Fire safety
- Laser hardening
- Satellite survivability

Environmental Effects on Naval Systems

- Meteorological effects on electro-optical system performance
- Air quality in confined spaces
- Electromagnetic background in space
- Solar and geomagnetic activity
- Magnetospheric and space plasma effects
- Nonlinear science
- Ionospheric behavior
- Oceanographic effects on weapons, sensors, and platforms

Imaging Research/Systems

- Remotely sensed signatures analysis

- Real-time signal and image processing algorithms/systems
- Image data compression methodology
- Image fusion
- Automatic target recognition
- Scene/Sensor noise characterization
- Image enhancement/noise reduction
- Scene classification techniques
- Radar and laser imaging systems studies
- Coherent/Incoherent imaging sensor exploitation
- Remote sensing simulation

Information Technology

- Antijam communication links
- Network architectures
- Battle management information systems
- Arctic communication links
- Information security (INFOSEC)
- Voice processing

Materials

- Superconductivity
- Bio/Molecular engineering
- Materials processing
- Advanced alloy systems
- Rapid solidification technology
- High-temperature materials
- Laser fabrication and processing
- Ceramics and composite materials
- Thin films and coatings
- Metamorphic materials/Smart structures
- Transduction materials
- Computational material science

Space Systems and Technology

- Advanced space systems
- Space sensing technology and applications
- Satellite communications
- Spacecraft design, engineering, and integration
- Satellite ground station design
- Navigation and time technology
- Remote sensing, calibration, and research
- Satellite survivability
- Spacecraft power systems technology
- Spacecraft materials
- Radiation effects on spacecraft

Surveillance and Sensor Technology

- Point defense technology
- Imaging radars
- Target classification/identification
- Airborne geophysical studies
- Fiber-optic sensor technology
- Undersea target detection/classification
- Sonar transducers
- Electromagnetic sensors—gamma ray to rf wavelengths
- SQUID for magnetic field detection
- Low observables technology
- Ultra-wideband technology
- VHSIC/MIMIC applications
- Interferometric imagery

Undersea Technology

- Autonomous vehicles
- Bathymetric technology
- Anechoic coatings
- Oceanographic instrumentation

Oceanography

- Open ocean, regional, and littoral oceanographic forecasting
- Shallow water tactical oceanography
- Arctic environmental quality
- In-situ oceanographic sensors and data fusion
- Bio-optical and fine-scale physical processes
- Bio-corrosion
- Environmental simulation
- Coastal scene generation
- Waves, tides, and surf prediction
- Couple model development
- Coastal/ocean bubble-optical characterization

Marine Geosciences

- Geoacoustic modeling to support acoustic performance prediction
- Marine seismology, including propagation and noise
- Geomagnetic modeling to support nonacoustic system performance
- Geotechniques/sediment dynamics affecting mine warfare and mine countermeasures
- Mapping and charting, including advanced seafloor mapping and imaging systems

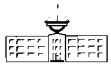
Meteorology

- Air/Sea interaction effects on operations
- Data assimilation techniques
- Global/Regional forecasting
- Tactical system development and application
- Weather effects on targets
- Meteorological tactical decision aids

Ocean Acoustics

- Underwater acoustics, including propagation, noise, and reverberation
- Fiber-optic acoustic sensors
- Shallow water environmental acoustics and sensor systems

Undersea warfare system performance modeling, unifying the environment, acoustics, and signal processing
Anechoic coatings
Target reflection, diffraction, and scattering
Simulations
Tactical decision aids
Sonar transducers
Metrology



Major Research Capabilities and Facilities

(Listed alphabetically by organizational unit)

Acoustics Division (Code 7100)

- Large tank instrumented for investigating acoustic echo and radiation characteristics of targets
- Tank 30 ft in diameter by 22 ft in depth, automated with computer control and analysis for detailed studies of acoustic fields, transducers, and other underwater devices
- Multichannel programmable digital data processing system: a system of DEC computers, high-speed array processors, and peripherals for up to 256 channels; designed for acoustic surveillance array processing
- Containerized data processing for acoustic array processing at remote sites and aboard ship
- Large acoustic pool facility, incorporating near-field conformal scanners and acoustic arrays for structural acoustics studies of underwater targets
- High-powered sound source array
- Vertical array with satellite telemetry
- Multiple towed acoustic arrays with up to 144 acoustic channels for measuring directional noise
- Twin underwater towers supporting sources and hydrophone arrays to measure high-frequency propagation, volume, and boundary scattering in shallow water
- High-speed maneuverable towed body with MK-50 and synthetic aperture sonars to measure high-frequency boundary scattering and coherence
- Tactical oceanography simulation laboratory

Center for Bio/Molecular Science and Engineering (Code 6900)

- Optical equipment
  - Confocal fluorescent microscope
  - CW fluorimeter and microscope
  - Excimer laser projection exposure system
  - Dektak surface profilometer
  - Optical and fluorescence microscopes
  - Photon correlation spectrometer
  - Picosecond dye laser system
  - Raman spectrometers
  - Scanning and transmission electron microscope
  - SLM fluorimeter (visible through near IR)
  - Time resolved fluorimeter (nanosecond)
  - UV-visible absorption spectrophotometers
- Analytical instruments
  - Atomic force/scanning tunnelling microscope
  - Capillary electrophoresis unit
  - Contact angle goniometer
  - Differential scanning calorimeter
  - DNA synthesizer; DNA sequencer
  - HPLC
  - Patch clamp microelectrodes
  - Potentiometer for electrochemistry
- General facilities
  - Class 100 clean room
  - Cold room for storage and preparation
  - Controlled shelf temperature lyophilizer
  - Silicon graphics IRIS workstation
  - Freeze-fracture apparatus
  - High speed ultracentrifuges
  - Inert atmosphere dry box
  - Langmuir-Blodgett film balance

Chemistry Division (Code 6100)

- Synthesis/processing facilities
  - Paint formulation and coating
  - Functional polymers/elastomers
  - Langmuir-Blodgett film
  - Surface cleaning
  - Thin film deposition/etching with in-situ control
  - High temperature chemistry
- Characterization facilities
  - General purpose chemical analysis
  - Surface diagnostics
  - Nanometer scale composition/structure/properties
  - Magnetic resonance NDI
  - Tribology
  - Polymer structure/function
- Special purpose capability
  - Environmental monitoring
  - Synchrotron interfacial spectroscopy/structure
  - Combustion and fire research
  - Alternate and petroleum-derived fuels
  - Simulation/modeling

Condensed Matter and Radiation Sciences Division (Code 6600)

- Hypervelocity gun ranges
- 3-MeV tandem Van de Graaff accelerator
- 200-keV ion-implantation facility
- Synchrotron radiation beam lines (at NSLS, Brookhaven, NY)
- Microwave test facility
- Excimer laser film deposition facility
- Bomen infrared spectrometer facility
- Diffuse light scattering facility

Electronics Science and Technology Division (Code 6800)

- Nano- and micro-electronics processing facility
- Electron-beam nanowriter
- High-resolution transmission electron microscope
- Scanning tunneling microscopy and electro-optical analysis
- Crystal-growing facilities including bulk growth, molecular beam expitaxy, and organo-metallic chemical vapor deposition
- Optical and electrical characterization of materials
- Electronic testing and analysis facilities
- Vacuum electronics engineering facility

Information Technology Division (Code 5500)

- Extensive computer facilities
- Connection machine
- HF modem and channel simulation
- Brandywine antenna range
- Pomonkey test range
- Signal analysis laboratory
- Artificial intelligence computer network
- Distributed simulation and prototyping test bed
- HCI laboratory
- Certification and INFOSEC engineering laboratory
- Virtual reality laboratory
- DOD high performance computing (HPC) distributed resources center
- Thinking machines CM-5E (256 processor nodes, 32 Gbytes memory)
- Thinking machines CM200 (16,000 processor nodes, 2 Gbytes memory)
- Lab-wide network, NICEnet, providing lab-wide computer communication, video services, and gateways to networks and computer systems worldwide
- Satellite dishes for video and data reception
- Microwave antennas receiving ITV from local universities
- File server/archiver system for central file storage of lab-wide data
- Cray Y-MP EL 2/512
- Visualization laboratory
- Lab-wide ADP training facility

Laboratory for Computational Physics and Fluid Dynamics (Code 6400)

- INTEL iPSC/860 Touchstone Gamma 32 node supercomputer
- Three IBM RS/6000 high capacity workstation class compute servers
- 256 M/byte CONVEX C210 mini-supercomputer
- Three DEC 3000/400 AXP workstations
- Two SGI IRIS 4D graphics workstations
- D2 Digital video and animation laboratory
- SUN Microsystems 670MP workstation server
- Over thirty SUN and MACINTOSH personal workstations
- All computers and workstations have network connections to NICEnet allowing access to the NRL CCF, the NRL connection machine, and many other computer resources both internal and external to NRL

Laboratory for Structure of Matter (Code 6030)

- Two area detector systems
- Two X-ray diffractometers
- Zymark robotics
- Four silicon graphics IRIS workstations
- Protein and peptide chromatography

Marine Geosciences Division (Code 7400)

- Airborne gravimetry, magnetics, and topographic measurement suite coupled with differential GPS yielding position accuracies of <1.0 meter
- Data acquisition and analysis system using Navy's fixed underwater surveillance system (SOSUS) to study earthquakes and whale migration patterns
- Deep-towed acoustic geophysical system operating at 250-650 Hz characterizes subseafloor structure including gas clathrate accumulations
- Acoustic seafloor classification system operating at 15-50 kHz provides underway, real-time prediction of sediment type and consistency
- Seafloor probes for measuring sediment pore water pressures and acoustic compressional and shear wave velocities and attenuations
- Transmission electron microscope with environmental cell for study of sediment fabric, especially impact of pollutant adsorption
- Map data formatting facility compresses map information onto compact disk-read only memory media for masters for use in aircraft digital moving map systems
- Magnetic observatory conducts measurements of ambient field and other magnetic phenomena
- Comprehensive geotechnical and geoacoustics laboratory capability
- Airborne ElectroMagnetic (AEM) bathymetry system
- Ocean bottom magnetometer system
- 3-D, multi-spectral, subbottom swath imaging system
- Ocean Bottom Seismographs (OBS)

In-Situ Sediment Acoustic Measurement System (ISSAMS)
Hydrothermal plume imaging data acquisition and analysis system
Integrated digital databases analysis and display system for bathymetric, meteorological, oceanographic, geoacoustic, and acoustic data

Marine Meteorology Division (Code 7500)

Tactical Environmental Support System (TESS(3)) prototype–concurrent 6605 computer
SMQ-11 shipboard antenna system for retrieving orbiting imagery
Naval Environmental Operational Nowcasting System (NEONS)–implemented on two HP9000/835 computers
Numerous PC's and SUN workstation computers
Real-time/archived global atmosphere/ocean databases

Materials Science and Technology Division (Code 6300)

Ultrasonic gas atomizer
Hot isostatic press
Cold isostatic press
Consumable arc electrode melter for reactive metals
High-energy, dispersive X-ray analytical system
Electron microprobe SEM and STEM systems
Quantitative metallography
Computer-controlled multiaxial loading and SCC measurement systems
Computer-interactive, nonlinear, multimode fracture measurement system
Computer-aided, experimental stress analysis
Crystallite Orientation Distribution Function (CODF)
Elevated temperature and structural characterization laboratory
Impression creep and mechanical property evaluation
Automated physical constant measurement systems
Nondestructive evaluation laboratory
Closed-loop, low- and high-cycle fatigue systems
Metallic film deposition systems
Magnetometry
Mossbauer spectroscopy
Cryogenic facilities
High-field magnets
Marine corrosion facility
High-resolution analytical electron microscope
Isothermal heat treating facility
Vacuum arc melting facility
Vacuum induction melting facility

Oceanography Division (Code 7300)

TOWED sensor and advanced microstructure profiler systems for studying upper ocean fine and micro-structure
Integrated absorption cavity and optical profiler systems for studying ocean optical characteristics
Environmental scanning electron microscope and confocal laser scanning microscope for detailed studies of bio-corrosion in naval materials
Self contained bottom mounted upwardlooking acoustic profilers for measuring ocean variability
Acoustic doppler profiler for determining ocean currents while under way
Fiber optic connection to the Navy's Class 7 large scale computer
Remotely operated underwater vehicle (ROV)
Unmanned underwater vehicle with optical sensors

Optical Sciences Division (Code 5600)

Electron-beam, electron-beam sustained, x ray, and UV preionized laser devices with spectroscopic and other diagnostic equipment
Short-pulse excitation apparatus for kinetic mechanisms investigations
Optical warfare laboratory
IR laser facility for optical characterization of semiconducters
Mobile, high-precision optical tracker
Facilities for synthesis and characterization of optical glass compositions and for the fabrication of optical fibers
Hybrid optical/digital image processing facilities
Silica and fluoride fiber-optic fabrication facilities
Facilities for fabricating and testing integrated optical devices
Optical probes laboratory to study viscoelastic, structural, and transport properties of molecular systems
Computer IR/EO technology/systems simulation center
High-energy pulsed chemical laser laboratory
100-J UV laser research facility
Laser diode pumped 10 watt 2mm solid state lasers
Field-qualified EO/IR measurements devices
Focal plane array evaluation facility

Plasma Physics Division (Code 6700)

PAWN, 1-MJ compact inductive storage facility
Gamble II high-voltage pulsed power generators
PHAROS III, three-beam neodymium-glass laser and target facility
1000-J NRL CO_2 laser
Table-Top Terawatt (T^3) laser system

NIKE krypton fluoride laser facility
Dense Z-pinch facility
High-power relativistic klystron and gyrotron facilities
Large volume space chamber
Electric mass launchers facility
Charged particle beam (CPB) propagation range
Super IBEX 5 MV, 100 kA, 40 ns CPB generator
Maxibeam 3 MV, 60 kA, 300 ns CPB generator

Radar Division (Code 5300)

Airborne research radar facility, including advanced profile high resolution imaging radar
Ship radar-cross-section computer prediction facility
Electromagnetic numerical computation facility
Shipboard radar research and development test beds:
1. Senrad wideband air surveillance radar facility
2. Volume surveillance radar test bed
3. Ship self-defense surveillance and engagement demonstration systems

Cooperative aircraft identification (IFF) ground station facility
Shipboard radar display facility
Compact range antenna measurement laboratory
Experimental mode-stirred chamber for electromagnetic compatibility qualification
CBD fleet radar systems facility
Space-time adaptive processing laboratory
Electronic computer-aided design facility
Clutter research radar

Remote Sensing Division (Code 7200)

Stratified tow channel
Millimeter-wave Atmospheric Sounder (MAS)
  MAS data facility
  MAS Spacelab instrument
Polar ozone and aerosol monitor space sensor
Ground-based stratospheric water-vapor monitoring system
Digital Image Processing Laboratory (DIPL)
  SAR processing facility
SCI processing facility
  SEALAB
  NASE LAB
MWO optical interferometer site
Navy prototype optical interferometer
General purpose image processing
Maryland Point Observatory
Green Bank interferometer
Washington VLBI correlator
WVMS NDSC instrument
Image working system
IRIS system and processor
IR test facility
SSM/I processing facility
STEMS-II boat
STEMS system
Ocean tower/platform/ship radar
  L,S,C,X,K, and W band
Ocean tower/lab/platform/ship radiometers
  6,10,14,19,22,35,37,85,90,140,220 GHz
Lidar field system
Aerosol and field measurement facility
Aerostat and blimp instrument system
Visualization Center
NRL RP-3A aircraft sensors
  Airborne Lidar
  MMW imagers (35,90,140,220 GHz)
  DMSP SSM/I simulator
  LFMR SST simulator
  PRT-5 IR radiometer
  Imaging real-aperture radar (RAR)
    X,C bands
  Precision altimeters
    X-band, 95 GH_3, Lidar
  Rotating scatterometer
  Tri-frequency-agile radar (TRIFAR)
  X-band interferometer
  Millimeter-wave (95 GHz) radar
  AXBT
  Flight-level meteorological sensors
  Navigation systems
    INS, GPS
  PHILL's
Shipboard sensor systems
  Surface met/ocean obs
  Lidar
  CTD
  Thermistor chains
  STAr (Surface Towed Array)
  Acoustic doppler velocity profilers

Research and Development Services Division (Code 3500)

Military construction
Scientific program
ONR facilities support
Research support engineering
Full range of facility contracting, including construction, architect/engineering services, facilities support, and base operating services
Transportation
Environmental
Planning
Maintenance and repair of buildings, grounds, and communication and alarm systems
Shops for machining, sheet metal, welding, castings, and plating

Radar experimental test site, which includes a variety of radars; ancillary equipment for test and evaluation of equipment, concepts, and techniques; and overwater ranges
Tactical electronic warfare test site
Communications facilities for transmission to and from land, sea, and air
Hypervelocity gun for ballistics research
Ship-motion simulator with 12-ton payload capacity
Boat services

Spacecraft Engineering Department (Code 8200)

Thermal-vacuum chambers
Acoustic reverberation chamber
Shock and vibration test facility
Clean-room facilities
Spacecraft-fabrication and assembly facility
Fuels test facility
CAD/CAM facility
Automatic welding facility
Static loads test facility
Spacecraft spin balance facility
Modal analysis facility

Space Science Division (Code 7600)

E.O. Hulburt Center for Space Research
Development and test facilities for spaceborne instruments to perform astrophysical, solar, high-atmospheric, and space-environment sensing
Clean-room facilities
Extensive computer-assisted data manipulation and interpretive capability for space-data imaging and modeling
Backgrounds Data Center (BDC) for analysis and archival storage of BMD-relevant natural backgrounds
Low-temperature laboratory
Gamma Ray Observatory (OSSE) operations and data analysis center
Solar instrument test facility
Solar Ultraviolet Spectral Irradiance Monitor (SUSIM) operations and data analysis center

Space Systems Development Department (Code 8100)

Electronic component computer aided design (CAD) facility
Payload test facility and processor development laboratory
Spacecraft high reliability electronic and electrical production facility
Spacecraft electronic systems integration and test high bay building
Spacecraft electrical power systems and battery laboratories
Electro-magnetic interference/electro-magnetic compatibility (EMI/EMC) screen room test facility
Precision oscillator (clock) test facility
Radio frequency (RF) system development facility
RF microcircuit fabrication cleanroom facility
Large tapered horn RF anechoic chamber facility
RF payload development laboratory with anechoic chamber
Precision high frequency RF compact range anechoic chamber facility
Satellite telemetry, tracking and control facilities
Pomonkey field site/large antenna, space communications and research facility
Midway Research Center/space communications and research facility

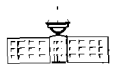
Tactical Electronic Warfare Division (Code 5700)

Mobile infrared signature measurement and simulation facility
Mobile ESM laboratory
Hybrid RF/IR missile-seeker simulation facility
Central target simulation facility for developing, testing, and evaluating EW systems and techniques, using real-time, hardware-in-the-loop models
RF simulation laboratory and signal simulators
Radar cross-section measurement facility (at CBD)
Search radar ECM simulator
Advanced tactical EW environment simulator
Electronic warfare coordination test bed
Scale-model analysis facility
Wind tunnel for performance measurements of low Reynolds number vehicles
Optical integration laboratory
Tempest signal-processing laboratory
Simulated ship-mast facility
Secure supercomputer facility
Vehicle development laboratory
Visualization laboratory

Technical Information Division (Code 5200)

Imaging center
Electronic publishing
Research library (1,100 current subscriptions, 170,000 monographs and bound journals, 1,800 rolls of microfilmed journals, 1,170,000

technical reports (225,000 hard copy, 800,000 microfiche, and 110,000 stored as digital page images), and 1,000 microcomputer software packages)
STILAS (Scientific and Technical Information Library Automation System) on-line library catalog
InfoNet campus-wide information system for desktop access to CD-ROM and other locally mounted databases and Internet resources
Microcomputer Software Support Center
Photographic laboratories
Writing, editing, and publications consultation
Graphic design services
Video recording and productions
Video editing suite
Scientific and technical photographers



NRL Sites and Facilities

SITE	ACREAGE		BUILDINGS/ STRUCTURES
	LAND OWNED/LEASED	EASEMENT/ LICENSE-PERMIT	
District of Columbia			
NRL and Artificial Intelligence Center at Bolling AFB	131/0	0/10.24	110/25
Virginia			
Midway Research Center Quantico	162/0		9/1
Maryland			
NRL Flight Support Detachment, NAS Patuxent River*	Tenant		
Chesapeake Bay Detachment and Dock Facility Chesapeake Beach*	157/0	0/0.60	63/87
Multiple Research Site Tilghman Island*	2/0		3/3
Radio Astronomy Observatory Maryland Point*	24/0		10/16
Radio Antenna Range USAF Receiver Site Brandywine*	0/0	0/22.98	1/0
Free Space Antenna Range Pomonkey*	56/0	28.40/0	9/11
Florida			
Marine Corrosion Facility Key West	Tenant		
California			
NRL Monterey Monterey*	Tenant		
Mississippi			
Stennis Space Center Bay St. Louis*	Tenant		
Alabama			
Ex-USS *Shadwell* (LSD-15) Mobile Bay	Tenant	Decommissioned 457-ft vessel used for fire research	

PROPERTY

Land:

Owned	556 acres
Leased	0 acres

Buildings:

RDT&E	3,219,834 ft^2
Administrative	224,564 ft^2
Other	422,427 ft^2

Replacement Costs:

Real property – current replacement value	$914 million
Equipment	$256.9 million

*See maps in the General Information section.

Executive Directorate

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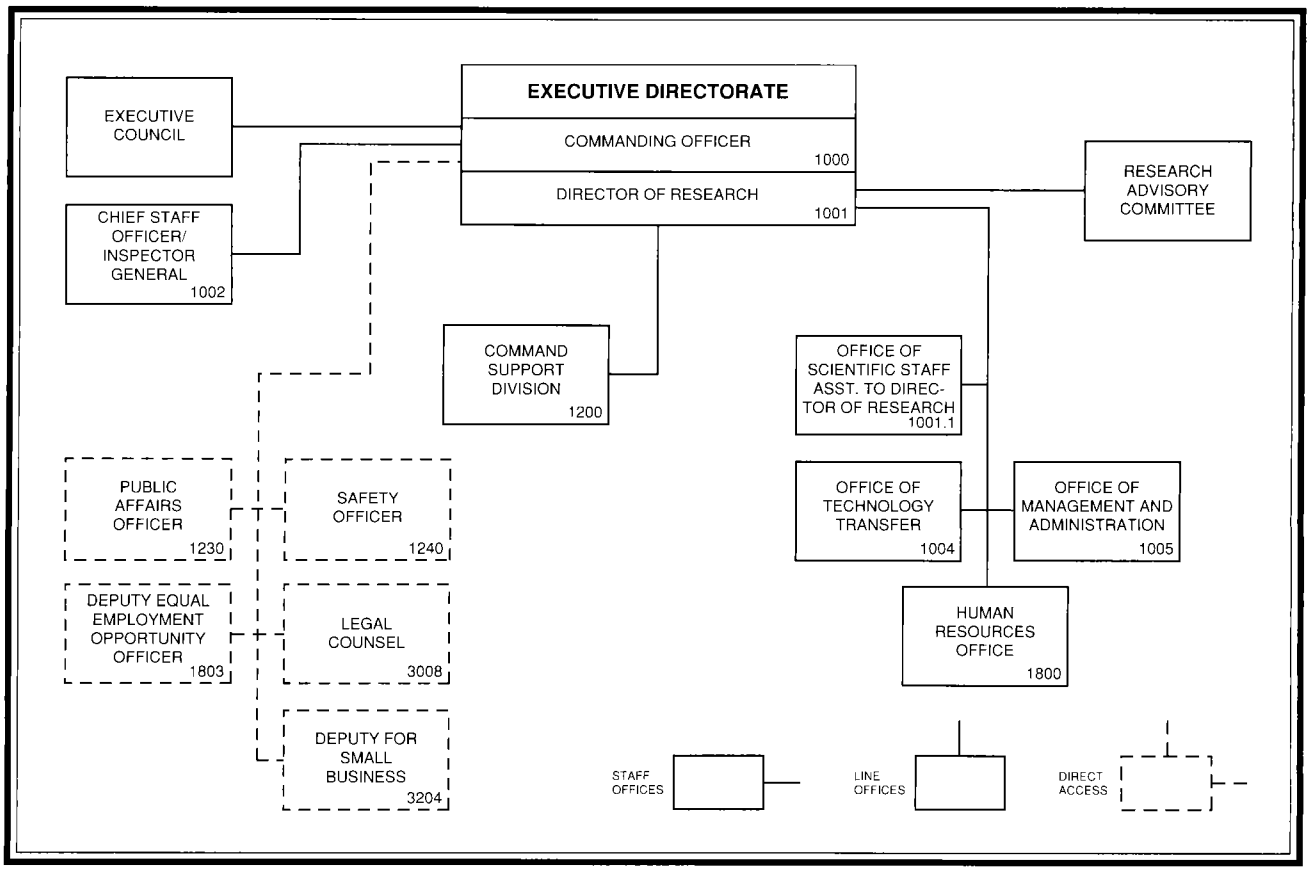


Key Personnel

Name	Title	Code
CAPT R.M. Cassidy, Jr., USN	Commanding Officer	1000
Dr. T. Coffey	Director of Research	1001
Mr. K.W. Lackie	Scientific Staff Assistant to Director of Research	1001.1
CAPT R. Leonard, USN	Chief Staff Officer/Inspector General	1002/1200
Dr. R.H. Rein	Head, Technology Transfer	1004
Mrs. M.C. Oliver	Head, Office of Management and Administration	1005
Mr. R.H. Baturin*	Head, Public Affairs Branch	1230
Mr. K.J. King	Head, Safety Branch	1240
Mrs. B.A. Duffield	Director, Human Resources Office	1800
Ms. D.E. Erwin	Deputy Equal Employment Opportunity Officer	1803
Ms. H.J. Halper	Legal Counsel	3008
Ms. P. Schaefer	Deputy for Small Business	3204

*Acting

Executive Directorate

The Commanding Officer and the Director of Research share executive responsibility for the management of the Naval Research Laboratory. In accordance with Navy requirements, the Commanding Officer is responsible for the overall management of the Laboratory and exercises the usual functions of command including compliance with legal and regulatory requirements, liaison with other military activities, as well as the general supervision of the quality, timeliness, and effectiveness of the technical work and of the support services.

The Commanding Officer delegates line authority and assigns responsibility to the Director of Research for the technical program, its planning, conduct, and staffing; evaluation of the technical competence of personnel; liaison with the scientific community; selection of subordinate technical personnel; exchange of technical information; and the effective execution of the NRL mission.

Within the limits of Navy regulations, the Commanding Officer and the Director of Research share authority and responsibility for the internal management of the Laboratory. The Commanding Officer retains all authority and responsibility specifically assigned to him by higher authority.

The mission of the Laboratory is carried out by four science and technology directorates and the Naval Center for Space Technology, supported by the Business Operations Directorate and the Executive Directorate. In addition, the Laboratory's operating staffs provide assistance in their special fields to the Commanding Officer and to the Director of Research. The operating staffs are listed on the following pages of this publication.

Commanding Officer (Code 1000)

CAPT Richard M. Cassidy, USN, became the 31st Naval officer to head the Naval Research Laboratory on April 28, 1994. Before coming to NRL, CAPT Cassidy was the Technical Director and Associate Program Manager in the AEGIS Program Office.

Prior to assuming his major program manager duties, CAPT Cassidy served in an extensive number of combat systems engineering assignments in the AEGIS Program. He served as the AEGIS Combat System Engineering Manager where he was responsible for the design, development, and lifetime support to Ticonderoga class cruiser and Arleigh Burke class destroyer combat systems. Prior to that he served as the AEGIS Combat Systems Operations Manager and established the AEGIS FMS case with Japan as well as several battle group and advanced AAW programs. Other ashore assignments included: Director of AAW Special Programs in the Naval Sea Systems Command; DDG 51 Combat System Manager, where he was part of the original project team that designed the Arleigh Burke class; instructor at the Engineering Duty Officer School; and System Engineer at the Joint Tactical Communications Office (TRI-TAC).

CAPT Cassidy's shipboard assignments included the USS Stickell (DD-888) and USS Conyngham (DDG-17). He became an Engineering Duty Officer in 1974.

He is a 1970 graduate of the University of North Carolina where he received a B.A. in Economics. He also holds a Master of Science in Electrical Engineering from the Naval Post Graduate School and a Masters in Business Administration from Farleigh Dickinson University. CAPT Cassidy was selected as the Navy's 1990 representative at the MIT Sloan School Program for Senior Executives.

CAPT Cassidy has been awarded the Legion of Merit, the Defense Meritorious Service Medal, the Meritorious Service Medal (two awards), and the Navy Commendation Medal.

CAPT Cassidy is married to the former Lois Bergman of Annandale, Virginia. The Cassidys reside in Annandale.

Director of Research (Code 1001)

Dr. Timothy Coffey [redacted]. He graduated from the Massachusetts Institute of Technology in 1962 with a B.S. degree in electrical engineering, and obtained his M.S. (1963) and Ph.D. (1967), both in physics, from the University of Michigan.

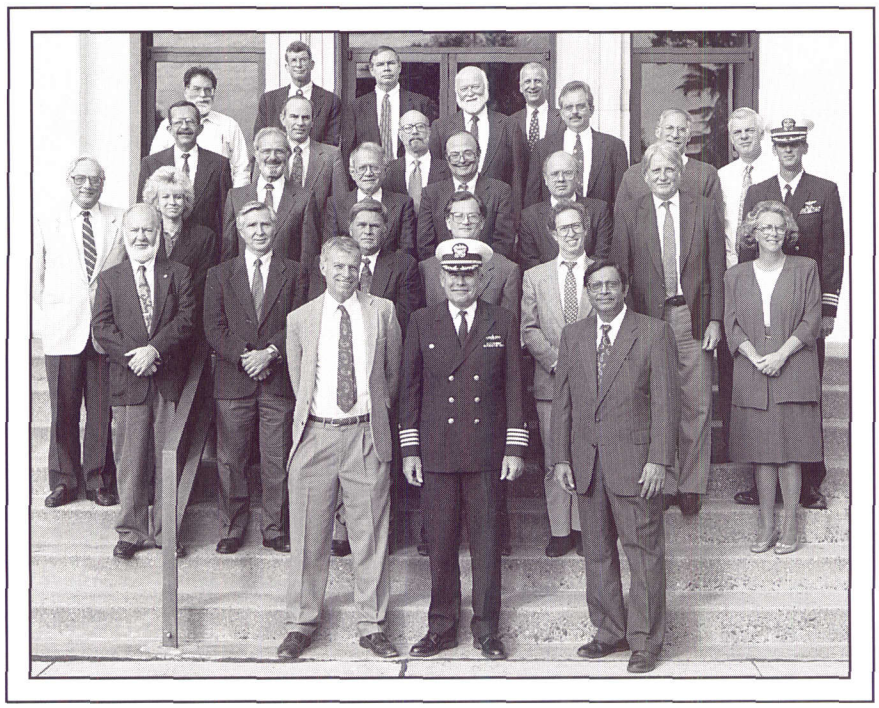
During his graduate career, Dr. Coffey worked as a research assistant at the University of California (1963-64), a research physicist at the Air Force Cambridge Research Laboratories (1964-65), and a teaching fellow and research assistant in physics at the University of Michigan (1965-66). As a scientific consultant for EG&G, Inc. (1966-71), he was involved in investigations in theoretical and mathematical physics.

Dr. Coffey came to the Naval Research Laboratory in 1971 as Head of the Plasma Dynamics Branch, Plasma Physics Division. In this position, he directed research in the simulation of plasma instabilities, the development of multidimensional fluid and magnetohydrodynamic codes, and the development of computer codes for treating chemically reactive flows. In 1975, he was named Superintendent, Plasma Physics Division; he was appointed Associate Director of Research for General Science and Technology on January 1, 1980. On November 28, 1982, he was named Director of Research.

Dr. Coffey is recognized as an authority on the theory of nonlinear oscillations and has played a major role in the national program on high-altitude nuclear effects. The author or co-author of over 70 publications and reports, he has made several fundamental contributions to the theory of electron beam/plasma interaction and to the understanding of plasma processes in the Earth's ionosphere.

Dr. Coffey is a fellow of the American Physical Society and a fellow of the Washington Academy of Sciences. In 1981, he was awarded the Presidential Rank of Meritorious Executive, in 1987 he received the Distinguished Presidential Rank award, in 1991 was awarded the Delmer S. Fahrney Medal, Franklin Institute, in October 1991 was awarded the DoD Distinguished Civilian Service Award, and in 1994 was awarded the Distinguished Presidential Rank Award.

Executive Council



The Executive Council consists of executive, management, and administrative personnel. Executive Council meetings are held to provide the Commanding Officer a personal means to relay new policy or changes to current policy that affects all divisions. These meetings also allow the other members of the Council to advise the Commanding Officer and Director of Research on matters relating to the administration of the Laboratory. The council also provides an opportunity for information exchange among its members. The Executive Council members include:

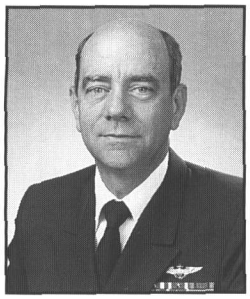
Commanding Officer, Chairperson
Director of Research
Associate Directors of Research
Chief Staff Officer
Director, Naval Center for Space Technology
Heads of Divisions
Head, Laboratory for Structure of Matter
Head, Laboratory for Computational Physics and Fluid Dynamics
Head, Center for Bio/Molecular Science and Engineering
Head, Human Resources Office
Public Affairs Officer
Deputy Equal Employment Opportunity Officer
Head, Office of Management and Administration
Head, Safety Branch
Head, Management Information Systems Staff
NRL Counsel

Research Advisory Committee

The Research Advisory Committee advises the Commanding Officer and the Director of Research on scientific programs and the administration of the Laboratory. The committee assists in planning the long-range scientific program, coordinating the scientific work, reviewing the budget, accepting or modifying problems, considering personnel actions, and initiating such studies as may be necessary or desirable. The membership consists of:

Director of Research, Chairperson
Commanding Officer
Associate Directors of Research
Chief Staff Officer (Observer)

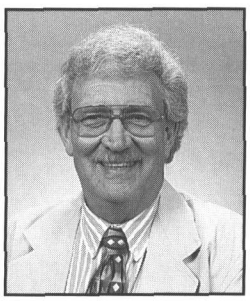
Chief Staff Officer/Inspector General
Code 1002



CAPT R. LEONARD, USN

The Chief Staff Officer serves as the Deputy to the Commanding Officer and acts for the Commanding Officer in his absence. The Chief Staff Officer is the Laboratory's Inspector General, and when directed, he investigates, inspects, and/or inquires into matters that affect the operation and efficiency of NRL. These matters include but are not limited to: effectiveness, efficiency, and economy; safety and occupational health; personnel discipline, morale, and welfare; management practices, command relationships, and organizational structure; and fraud and waste. He serves as principal advisor to the Commanding Officer on all inspection matters and audits and is the principal point of contact and liaison with all agencies outside NRL.

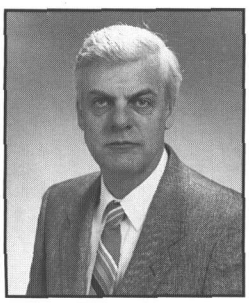
Public Affairs Officer
Code 1230



MR. R.H. BATURIN*

The Public Affairs Officer (PAO) advises the Commanding Officer and Director of Research on public affairs matters, including external and internal relations, community outreach, and serves as the Commanding Officer's principal assistant in the area of public affairs. To do this, the PAO plans and directs a program of public information dissemination on official NRL activities. The PAO coordinates responses to requests from the news media and the public for unclassified information or materials dealing with the Laboratory, coordinates participation in community relations activities, and directs the NRL history and internal information programs. The PAO is also responsible for coordinating all actions within the Laboratory that respond to requirements of the Freedom of Information Act (FOIA).

Safety Officer
Code 1240



MR. K.J. KING

The Safety Officer is the program manager for Occupational Safety and Health, Explosives Safety, Industrial Hygiene, Hazardous Material Control and Management, Radiological Safety, and Non-Ionizing Radiation Safety. The Safety Officer must ensure that each program complies with the appropriate federal, state, Navy, and NRL regulations. Specific functions include the development, implementation, and maintenance of comprehensive safety programs in support of the Laboratory's unique areas of research and development.

*Acting

Ms. D.E. Erwin

Deputy Equal Employment Opportunity Officer
Code 1803

The Deputy Equal Employment Opportunity Officer (DEEOO) is the EEO program manager and the advisor to the Commanding Officer on all EEO matters. The DEEOO manages the discrimination complaint process and directs the Laboratory's affirmative action plans and special emphasis programs (Federal Women's, Hispanic Employment, African American Employment, Asian-Pacific Islanders, American Indian Employment, Individuals with Disabilities, including Disabled Veterans). The DEEOO recruits quality candidates for those areas when underrepresentation exists. Duties also include reviewing, coordinating, and monitoring implementation of EEO policies and developing local guidance, directives, and implementation procedures for the EEO programs.

Ms. H.J. Halper

Legal Counsel
Code 3008

The Office of Counsel is primarily responsible for providing legal services to NRL's management in all areas of general and administrative law, as well as intellectual property law. The Office reviews all procurement-related actions; reviews NRL scientific papers prior to publication; prepares patent applications and prosecutes the applications through the Patent and Trademark Office; defends against contract protests, other contract litigation, and personnel cases; and advises on other legal matters relating to technology transfer, personnel, fiscal, and environmental law. NRL Counsel also serves as legal advisor to the Commanding Officer and Director of Research.

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Office of Management and Administration

Code 1005

MRS. M.C. OLIVER

Basic Responsibilities

The Office of Management and Administration provides managerial, technical, and administrative support to the Director of Research in the planning and direction of research and development programs in a variety of scientific and engineering disciplines. Specific functions include: performing special studies involving major NRL programs and resource issues; providing administrative support in the areas of personnel, budget, facilities, equipment, and security; reviewing and managing the Director of Research's correspondence; providing management information and analyses for various aspects of the research program effort; coordinating VIP and foreign visits to NRL; managing NRL facilities; providing Laboratory-wide administrative services, including mail handling and messenger service; managing the NRL Directives System; coordinating unsolicited proposals, congressional correspondence, and other external inquiries; maintaining the NRL R&D achievements file; reviewing and interpreting external Navy and DoD directives addressed to NRL; coordinating the IR&D Program; developing guidance for and monitoring the NRL S&T Program; providing LAN systems administration and central word processing services to the Directorate; coordinating the NRL-NRC and other Postdoctoral Resident Research Associateship Programs, NRL-U.S. Naval Academy Faculty Co-op Program, Navy ASEE Program, and other special Navy programs; interacting with ONR Headquarters and the Warfare Centers; and assisting in the development of NRL's five-year Plan.

Personnel: 60 full-time civilian

Key Personnel

Name	Title	Code
Mrs. M.C. Oliver	Head	1005
Mrs. L.S. Herrin	Deputy Head	1005.1
Ms. B.J. McDonald	Administrative Officer	1005.2
Mr. E. Rank	NRL Facilities Manager	1005.4
Mr. R.C. Spragg	Head, Management Information Staff	1005.5
Ms. M.E. Barton	Head, Directives Staff	1005.6
Ms. J. Hileman	Head, GLSIP Program	1005.7
Ms. L.T. Warder	Head, Administrative Services Staff	1005.8

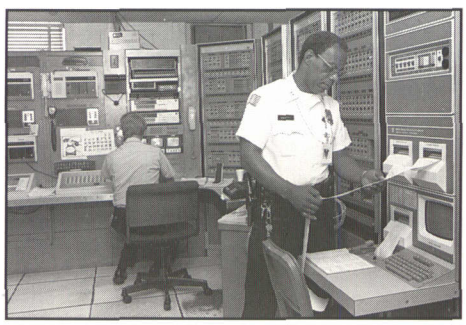
Point of contact: Ms. B.J. McDonald, Code 1005.2 (202) 767-3634

Command Support Division

Code 1200
Staff Activity Areas

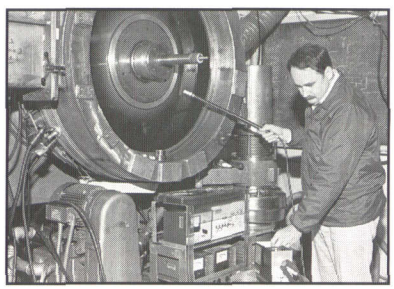
- Military Operations
- Security
- Public Affairs
- Safety
- Flight Detachment

Public affairs



Security monitoring

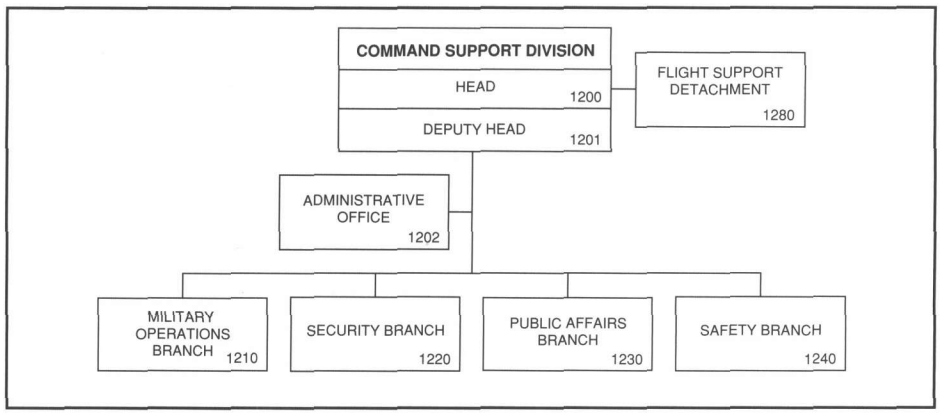
P-3 airborne research facility



Safety evaluation

Incoming visitor's reception area

CAPT R. LEONARD, USN



Basic Responsibilities

The Command Support Division, under the direction of the Chief Staff Officer, provides military and civilian staff to the Commanding Officer and to the Director of Research for direct research support and assistance in the military aspects of the management of the Laboratory.

The military staff is the liaison with DoD, Navy commands and activities, and the operating forces of the Navy and arranges for air, surface, and subsurface services as required by research and development operations. Coordination of support to the research divisions through the Naval Reserve Units in the Technology Mobilization Program is also coordinated through Code 1200. In addition, direct research support is provided by the Flight Support Detachment, located at NAS Patuxent River, Maryland, which operates and maintains four specially configured P-3 Orion aircraft.

The Division is also responsible for the Laboratory's physical, personnel, information, industrial and ADP security programs, and its communications service, as well as fire protection, occupational health and industrial hygiene, and the public affairs program. It provides intelligence support and support for international cooperative agreements in technology. The Division also coordinates the Laboratory's Management Control Program and provides liaison and coordination for all audit and inspection teams.

Personnel: 144 full-time civilian; 149 military

Key Personnel

Name	Title	Code
CAPT R. Leonard, USN	Head	1200
Mr. J.C. Payne	Deputy Head	1201
Ms. M.A. Sepety	Administrative Officer	1202
Ms. M.S. Rathbun	Management Control Officer	1203
CDR R.V. Young, USN	Military Operations Officer	1210
LT R.A. Amann, USN	Military Administration and Personnel	1213
Mr. J.R. Gallagher	Communications/Message Center	1215
Mr. J.C. Payne	Head, Security Branch	1220
Mr. C. Herbert	Deputy Head, Security Branch	1220.1
Mr. C. Rogers	Head, Classification Management and Control Section	1221
Dr. J. Miller	Head, Special Security Office and NRL Scientific and Technical Intelligence Liaison Office	1225
Mr. C. Herbert	Head, Personnel and Physical Security Section	1226
Mr. R.H. Baturin*	Head, Public Affairs Branch	1230
Mr. K.J. King	Head, Safety Branch	1240
CDR S.S. Smith, USN	Officer in Charge, Flight Support Detachment	1280

Point of contact: Ms. M.A. Sepety, Code 1202 (202) 767-3204

*Acting

Human Resources Office

Code 1800
Staff Activity Areas

- Personnel Operations
- Employee Development
- Employee Relations
- Equal Employment Opportunity
- ONR Satellite HRO
- NRL-SSC Satellite HRO
- Management and Systems Technology

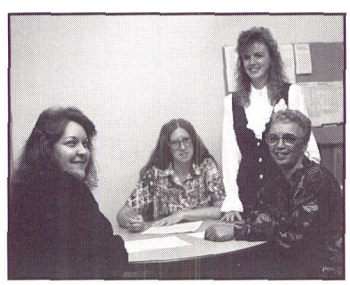
Training Branch

EEO Staff

Employee Relations Branch

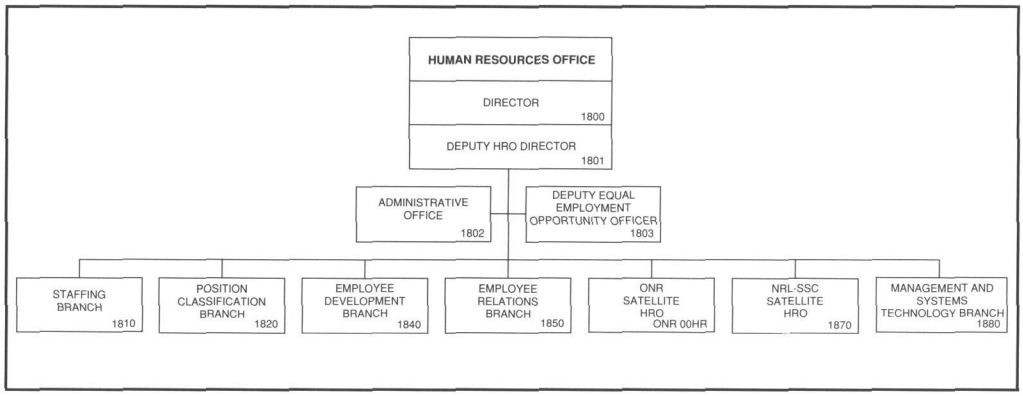
Workforce Support and
Manpower Program

Records Processing Staff



Staffing Branch

MRS. B.A. DUFFIELD



Basic Responsibilities

The Human Resources Office (HRO) provides civilian personnel and Equal Employment Opportunity (EEO) services to the Office of Naval Research (ONR), the Commander, Naval Meteorology and Oceanography Command (CNMOC), the Naval Oceanographic Office (NAVOCEANO), and the Naval Research Laboratory (NRL). The Human Resources Program provides the full range of operating civilian personnel management in the staffing and placement, position classification, employee relations, labor relations, employee development, and EEO functional areas. At NRL, the Manpower Management and Morale, Welfare, and Recreation Programs are also included. At ONR, the Manpower and Position Management Program is included.

Personnel services are furnished for a civilian complement of approximately 5,200 employees. The Hub Office at NRL-Main Site in Washington, DC, services approximately 3,300 employees as well as provides a centralized capability to perform various managerial, service, and advisory functions in support of satellite office operations and serviced organizations' needs. These include such items as issuance of policy and procedural directives; development, design, and maintenance of automated systems; and monitoring and evaluating product effectiveness to develop and maintain efficient, cost-effective, service-oriented methods.

The Satellite HRO at Stennis Space Center (SSC), Bay St. Louis, Mississippi, services about 1,000 employees of CNMOC and NAVOCEANO and approximately 400 NRL-SSC/Monterey (California) employees. The Satellite HRO at Arlington, Virginia, services about 600 employees of the ONR. Approximately 30 percent of the employees serviced are professional scientists and engineers at senior grade levels up to and including Scientific Technical and Senior Executive Service (SES).

Personnel: 93 work years

Key Personnel

Name	Title	Code
Ms. B.A. Duffield	Director	1800
Mr. Darryl Schenk	Deputy Director	1801
Ms. P.L. Hetzler	Administrative Officer	1802
Ms. D.E. Erwin	Deputy Equal Employment Opportunity Officer	1803
Ms. C. Downing	Head, Staffing Branch	1810
Ms. S. Weston	Head, Position Classification Branch	1820
Mr. F.W. Robbins	Head, Employee Development Branch	1840
Ms. J.L. Walker	Head, Employee Relations Branch	1850
Ms. C. Sherman	Site Manager, NRL-SSC Human Resources Satellite Office	1870
Ms. J.M. Sykes	Head, Management and Systems Technology Branch	1880
Ms. M. Aylor	Site Manager, ONR Human Resources Satellite Office	ONR 01HR

Point of contact: Ms. P.L. Hetzler, Code 1802 (202) 767-8327

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Business Operations Directorate

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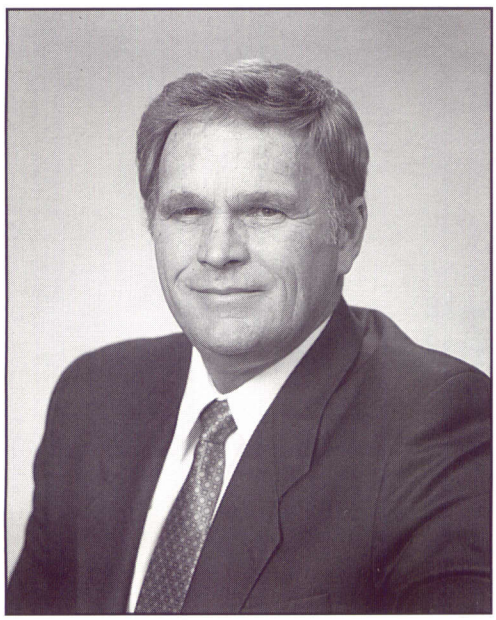
BUSINESS OPERATIONS DIRECTORATE

Code 3000

The Business Operations Directorate provides executive management, policy development, and program administration for business programs needed to support the activities of the scientific directorates. This support is in the areas of legal counsel, manpower management, financial management, supply management, contracting, public works, and management information systems support.

Associate Director of Research for Business Operations

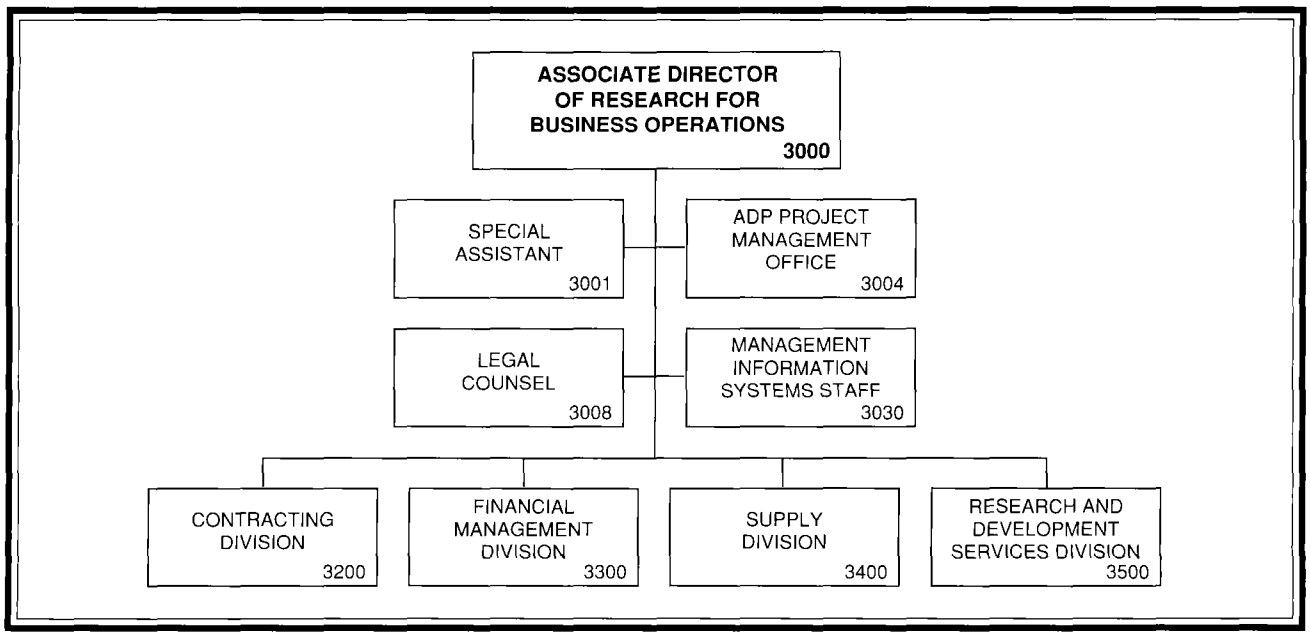


Mr. R.E. Doak [redacted] He graduated from Benjamin Franklin University with a bachelor's degree in accounting in 1964 and a master's degree in business administration in 1966. Mr. Doak is a Certified Public Accountant licensed by the State of Maryland.

Mr. Doak has twenty-six years of diversified experience with the Federal Government performing in various line management positions. He has extensive experience in program management, financial management, contract policy and administration; personnel policy and administration; ADP systems development and operations; and the full spectrum of management disciplines associated with the development, production, and operational support of major weapon systems.

From 1967 to 1980, Mr. Doak served in several positions with the Navy's Strategic Systems Projects Office. In these positions, he was responsible for the business management operations for the Navy's Fleet Ballistic Missile programs. In 1980, he entered the Senior Executive Service and served as Director of Financial Management with the Bureau of Indian Affairs. From 1981 to 1985, he served as Deputy Director, Plans and Programs, with the Strategic Systems Programs Office. From 1985 to 1989, he served as Deputy Commander with the Space and Naval Warfare Systems Command. In March 1989, Mr. Doak was appointed Associate Director of Research for Business Operations at the Naval Research Laboratory.

Mr. Doak has a consistent record of outstanding performance since entering the Senior Executive Service in 1980. In 1984, he was awarded the Navy Superior Service Award. In 1985 and 1988, he received Navy Rank Awards. In 1986, Mr. Doak received the Presidential Meritorious Executive Rank Award, and in 1988, he received the Presidential Distinguished Executive Rank Award.



Key Personnel

Name	Title	Code
Mr. R.E. Doak	Associate Director of Research for Business Operations	3000
Ms. G.L. Spisak	Special Assistant	3001
Ms. B.L. Hildreth	ADP Project Management Officer	3004
Ms. H.J. Halper	Legal Counsel	3008
Mr. R.L. Guest	Head, Management Information Systems Staff	3030
Mr. J. Ely	Head, Contracting Division	3200
Mr. D.T. Green	Comptroller	3300
Ms. C. Hartman	Supply Officer, Supply Division	3400
Mr. D.K. Woodington	Director, Research and Development Services Division	3500

Point of contact: Ms. G.L. Spisak, Code 3001 (202) 404-7462

Legal Counsel

Code 3008

Ms. H.J. Halper

Basic Responsibilities

The Office of Counsel is responsible for providing legal services to NRL's management in all areas of general, administrative, intellectual property, and technology transfer law. The Office reviews all procurement-related actions; reviews NRL scientific papers prior to publication; prepares patent applications and prosecutes the applications through the Patent and Trademark Office; defends against contract protests, other contract litigation and personnel cases; and advises on other legal matters relating to technology transfer, personnel, fiscal, and environmental law.

NRL Counsel also serves as legal advisor to the Commanding Officer and Director of Research.

Personnel: 25 full-time civilian

Key Personnel

Name	Title	Code
Ms. H. Halper	NRL Counsel	3008
Mr. C. Steenbuck	Associate Counsel/General	3008.1
Mr. T. McDonnell	Associate Counsel/Patents	3008.2
Mr. A. Beede	Associate Counsel/SSC	3008.3

Point of contact: Ms. P. Schuler, Code 3008 (202) 767-2244

Management Information Systems Staff

Code 3030

Mr. R.L. Guest

Basic Responsibilities

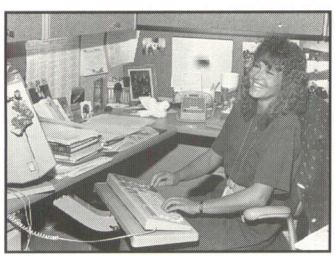
The Management Information Systems Staff has dual responsibilities: conducting administrative data processing for the Laboratory, and designing, implementing, and controlling the Laboratory Management Information System (MIS) and its databases. The Staff Head participates directly with the Commanding Officer, the Director of Research, and the Associate Director for Business Operations in all policy matters pertaining to MIS and business data processing.

Personnel: 19 full-time civilian

Key Personnel

Name	Title	Code
Mr. R.L. Guest	Head	3030
Ms. P. Lowery	Head, Systems Development Section	3035
Mr. W.L. Gollaher	Head, Applications Systems Support	3036
Mrs. D. Martin	Head, Operations Section	3037

Point of contact: Ms. P. Thompson, Code 3030 (202) 767-2030



Systems Management

Management Information Systems Staff

Computer Operations

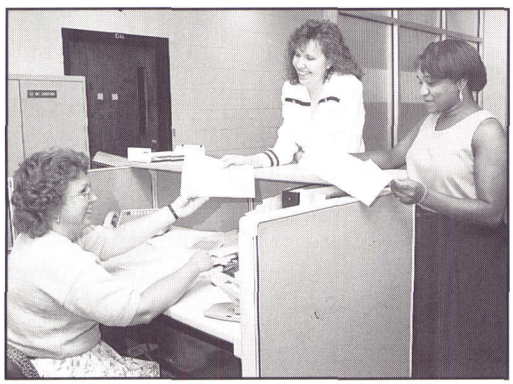
Systems Development

Contracting Division

Code 3200

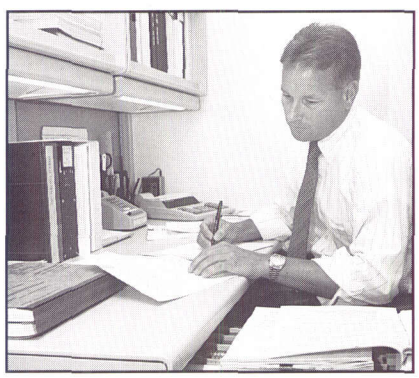
- Advance Acquisition Planning
- Acquisition Strategies
- Acquisition Training
- Contract Negotiations
- Contractual Execution
- Contract Administration
- Acquisition Policy Interpretation and Implementation

Member of Policy and Analysis Branch discussing the changes in DoD regulations

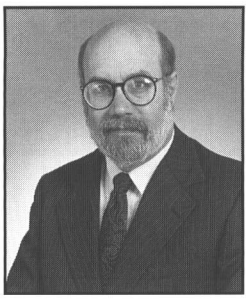


Procurement technicians discuss the Laboratory's Procurement Information Processing System (PIPS)

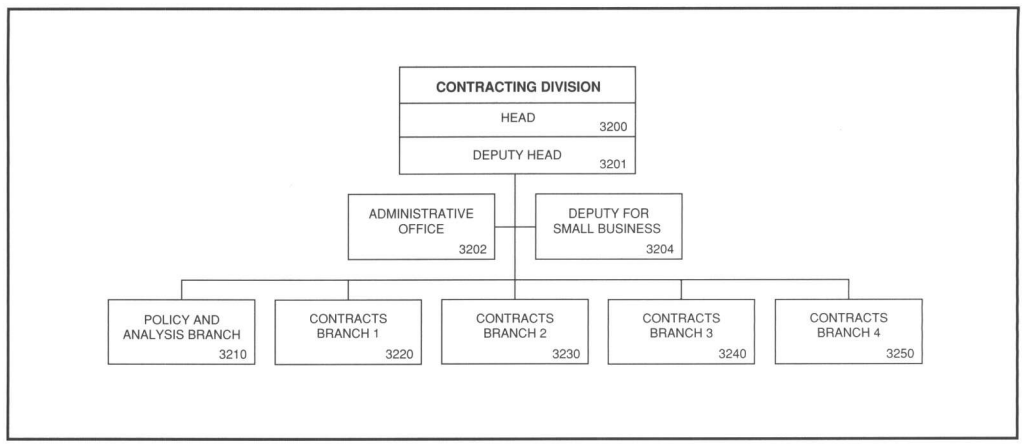
Deputy Division Head conducts staff meeting



Contract specialist prepares contract award



MR. J. ELY



Basic Responsibilities

The Contracting Division is responsible for the acquisition of major research and development, materials, services, and facilities where the value is in excess of $25,000. It also maintains liaison with the ONR Procurement Directorate on procurement matters involving NRL. Specific functions include: providing consultant and advisory services to NRL division personnel on acquisition strategy, contractual adequacy of specifications, and potential sources; reviewing procurement requests for accuracy and completeness; initiating and processing solicitations for procurement; awarding contracts; performing contract administration and post-award monitoring of contract terms and conditions, delivery, contract changes, patents, etc., and taking corrective actions as required; providing acquisition-related training to division personnel; and interpreting and implementing acquisition-related Federal Department of Defense and Navy regulations.

Personnel: 70 full-time civilian

Key Personnel

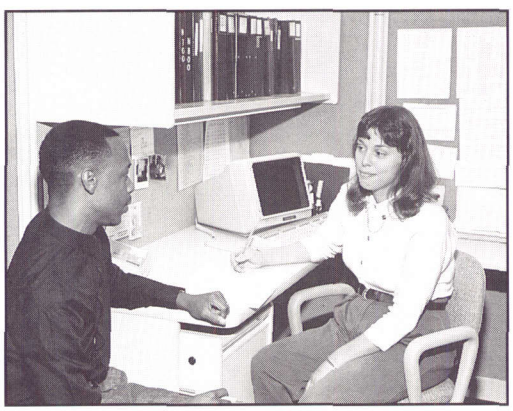
Name	Title	Code
Mr. J. Ely	Head	3200
Ms. M. Carpenter	Deputy Head	3201
Mrs. J. Price	Administrative Officer	3202
Ms. P. Schaefer	Deputy for Small Business	3204
Mr. J. Waldenfels	Policy and Analysis Branch	3210
Ms. W. Conaway	Contracts Branch 1	3220
Mr. E. Tunney	Contracts Branch 2	3230
Ms. M. Carpenter	Contracts Branch 3	3240
Mr. J. Adams	Contracts Branch 4	3250

Point of contact: Mrs. J. Price, Code 3202 (202) 767-3749

Financial Management Division

Code 3300

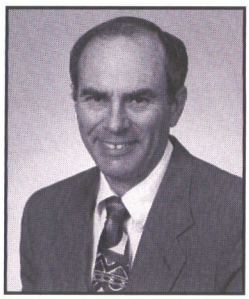
- Travel Administration
- Budget
- Reports and Statistics
- Accounting



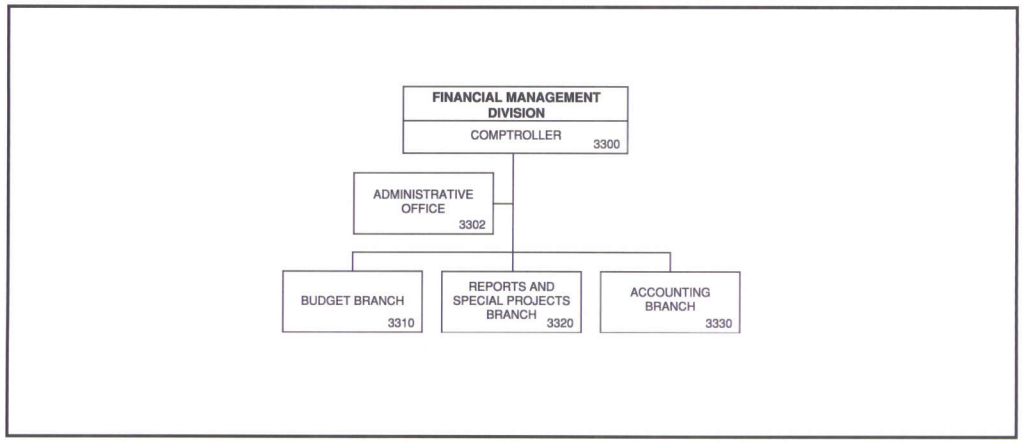
The Budget Section provides guidance and instructions for budget preparation and funds administration, and prepares progress reports and special statistical data as required.

The Accounting Branch performs services essential to the Laboratory including vendor payments, cost accounting, and ledger accounting

The Travel Services Unit processes travel orders and examines travel claims for payment



MR. D.T. GREEN



Basic Responsibilities

The Comptroller is the financial adviser to the Commanding Officer, the Director of Research, and other officials of the Laboratory, and he administers the financial program of the Laboratory.

The Financial Management Division provides services to the Laboratory in budget formulation, funds administration, program and budget analysis, cost accounting, travel administration and reporting. In addition, the Division provides essential information and guidance concerning equipment management.

Personnel: 81 full-time civilian

Key Personnel

Name	Title	Code
Mr. D.T. Green	Comptroller	3300
Ms. A.J. Downs	Administrative Officer	3302
Mr. M.C. Mills	Head, Budget Branch	3310
Ms. D. Camp*	Head, Reports and Special Projects	3320
Mr. J.V. Thomas	Head, Accounting Branch	3330
Ms. T. Frye	Head, Travel Services Unit	3334
Ms. A. Cutchember	Head, Payroll Liaison Unit	3335

Point of contact: Ms. A.J. Downs, Code 3302 (202) 767-2950

*Acting

Supply Division

Code 3400

- Administrative Services
- Customer Liaison
- Automated Inventory Management System
- Purchasing
- Receipt Control
- Material
- Technical

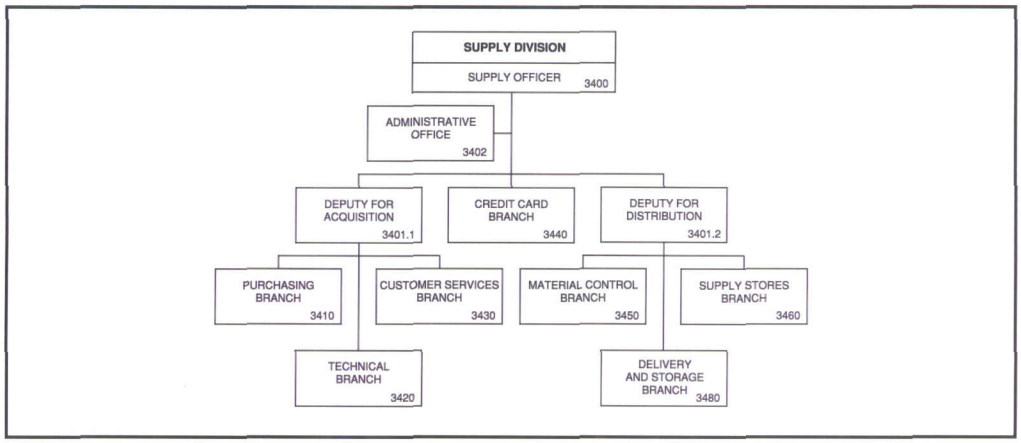
Documentation for the acquisition files are copied by the Contracting Officer

A rigging worker stores material in warehouse storage racks

Purchasing agents verify GSA prices on microfiche

Credit Card Branch personnel prepares for a regularly scheduled audit

Ms. C. Hartman



Basic Responsibilities

The Supply Division provides the Laboratory and its field activities with contracting, supply management, and logistics services. Specific functions include: procuring required equipment, material, and services; receiving, inspecting, storing, and delivering material and equipment; packing, shipping, and traffic management; surveying and disposing of excess and unusable property; operating various supply issue stores and performing stock inventories; providing technical and counseling services for the research directorates in the development of specifications for a complete procurement package; and obtaining and providing guidance in the performance stages of contractual services.

Personnel: 125 full-time civilian

Key Personnel

Name	Title	Code
Ms. C. Hartman	Supply Officer	3400
Mr. J. Booros	Contract Specialist	3401.1
Ms. P. Carter	Administrative Officer	3402
Ms. M. Smith	Head, Purchasing Branch	3410
Mr. G. Smith	Head, Technical Branch	3420
Ms. B. Mohammed	Head, Customer Services Branch	3430
Ms. K. Hunter	Head, Credit Card Branch	3440
Ms. P. Carter*	Head, Material Control Branch	3450
Ms. E. Woodland	Head, Supply Stores Branch	3460
Mr. T. Major	Head, Delivery and Storage Branch	3480

Point of contact: Ms. A. Olson, Code 3402 (202) 767-3871

*Acting

Research and Development Services Division

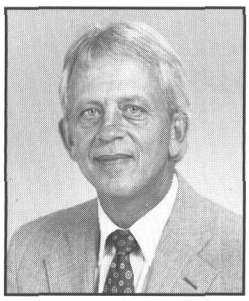
Code 3500

- Contracts
- Environmental
- Project Management
- Operations
- Administration
- Engineering
- Chesapeake Bay Detachment

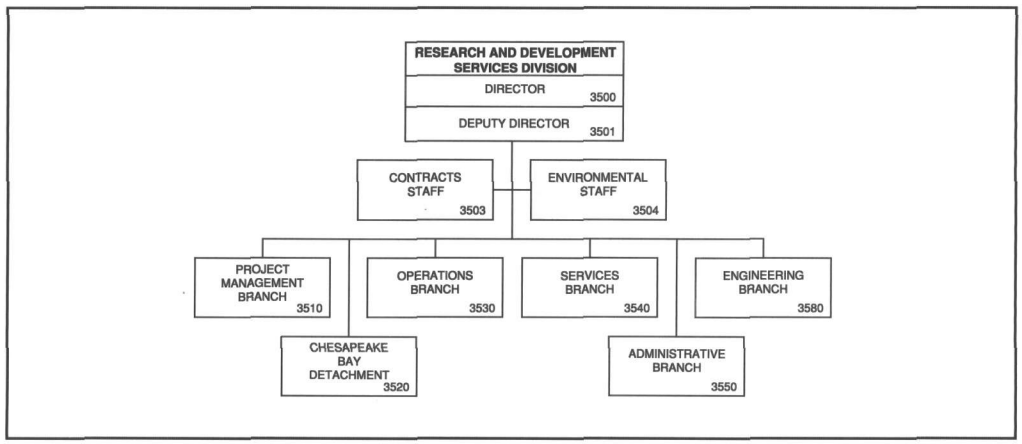
Main switch gear undergoing emergency repair

Entrance to Remote Sensing Division under construction

Mezzanine of Remote Sensing Division under construction



MR. D.K. WOODINGTON



Basic Responsibilities

The Research and Development Services Division is responsible for the physical plant of NRL and subordinate field sites. This includes: military construction, engineering, construction, facility support services, planning, environmental, maintenance/repair/operation of all infrastructure systems, transportation, and vertical transport equipment.

The Division provides engineering and technical assistance to the research divisions in the installation and operation of critical research equipment in support of the research mission.

The Division is responsible for compliance with all environmental regulations and approval authorities required by the command. The Division also supports the Office of Naval Research for all facilities operations and acquisition.

Personnel: 186 full-time civilian; 1 military

Key Personnel

Name	Title	Code
Mr. D.K. Woodington	Director	3500
Mr. S. Harrison	Deputy Director	3501
LT J. Foltz	Contracts Staff	3503
Mr. E. McDaniel	Environmental Staff	3504
Mr. T. Erwin	Project Management Branch	3510
Mr. M. Kosky	Chesapeake Bay Detachment	3520
Mr. F. Regalia	Operations Branch	3530
Mr. J. Headley	Services Branch	3540
Ms. L. Jones	Administrative Branch	3550
Vacant	Engineering Branch	3580

Point of contact: Ms. L. Jones, Code 3550 (202) 767-2168

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General Science and Technology Directorate

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GENERAL SCIENCE AND TECHNOLOGY DIRECTORATE

Code 4000

The General Science and Technology Directorate coordinates and/or manages specific NRL programs that may be multi-disciplinary in nature, may span both divisions and directorates, and may also require special security procedures. It is the Laboratory's focal point within the Navy and DoD for Low Observables Materials and Structures programs. The Directorate conducts or coordinates studies, reviews, and technical assessments in various topical areas. Areas of strong emphasis currently include all aspects of signature control and counter-signature technology, strategic and tactical missile defense, synoptic structure, and quality assurance for both corporate exploratory development programs and joint Space System Technology Programs. The NRL Signature Technology Office and the Critical Technology Assessment Office are contained within the Directorate. Program management activities related to the Navy 6.2 (exploratory development) effort and studies and analyses relating to the Ballistic Missile Defense Organization (BMDO) and other programs are carried out within the Directorate.

Associate Director of Research for General Science and Technology

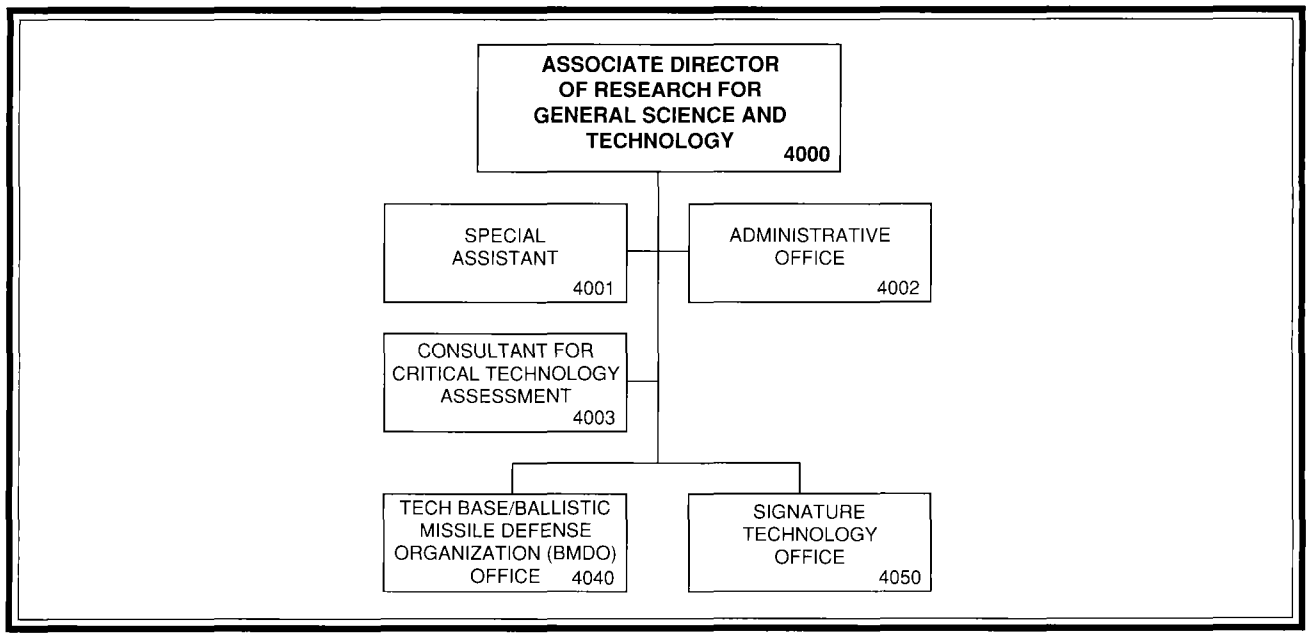
Dr. R.A. LeFande [redacted]. He attended the Brooklyn Technical High School and obtained his undergraduate degree in physics from the University of Rhode Island in 1962. After a brief tour as a telephone equipment engineer with Western Electric Company in New York City, he returned to academic pursuits, earning a Master's degree in physics from the Rutgers University in 1965.

In July of 1965, Dr. LeFande joined the Naval Research Laboratory as a research physicist in the Satellite Communications Branch. He worked on a variety of projects related to the design of waveforms for Naval applications, calibration of antennas and path losses by methods borrowed from radio astronomy, and on the design and acquisition of satellite communication terminals for shipboard and submarine use. By drawing on this work for a thesis topic, he obtained his Ph.D. from the University of Maryland in 1973 in the areas of astronomy and astrophysics.

In 1976, Dr. LeFande became Head of the Special Communications Branch where he nurtured and encouraged a NRL team of scientists and engineers in the development of satellite communications terminals that are now being deployed in the Fleet, and in establishing the scientific understanding and practical design principles that contributed to the selection of waveforms for MILSTAR and other systems.

From 1979 to 1981, Dr. LeFande was Technical Director and System Engineer of the Special Communication Project of the Naval Electronic Systems Command. He oversaw several research and acquisition programs related to submarine communications, which covered the spectrum from extremely low frequencies through optics and included the maintenance and operation of a world-wide network of radio transmitter facilities. After termination of the project and a brief tour as Deputy Director, Research and Technology Group, Dr. LeFande returned to NRL as Superintendent of the Aerospace Systems Division. Here he guided a diverse program of basic applied research in Wide Area Surveillance Systems, Space Warfare, and in related areas of physical science, materials, and device technology. From 1983 to 1990, Dr. LeFande served as Associate Deputy Assistant Secretary of the Navy (C^3I and Space), providing technical and philosophical advice to eight assistant and deputy assistant secretaries. In this capacity, he took a keen interest in the issues of acquisition management reform and of the appropriate roles and missions of the Laboratory and the other centers in the acquisition process. During this tour, Dr. LeFande was selected as a Legis Fellow and served on the staff of Representative Byron for six months in 1989, working on a variety of issues and legislation related to Armed Services, Science and Technology, Foreign Affairs, and other matters.

Dr. LeFande returned to the Laboratory in October 1990 where he served on the staff of the Director of Research. He was designated Acting Associate Director of Research in February 1991 and Associate Director of Research in February 1992.



Key Personnel

Name	Title	Code
Dr. R.A. LeFande*	Associate Director of Research for General Science and Technology	4000
Ms. B.J. Turner	Special Assistant	4001
Ms. D. Ernst	Administrative Officer	4002
Mr. L.M. Winslow	Consultant for Critical Technology Assessment	4003
Dr. S. Sacks	Technology Base/Ballistic Missile Defense Organization	4040
Dr. D.W. Forester	Signature Technology Office	4050

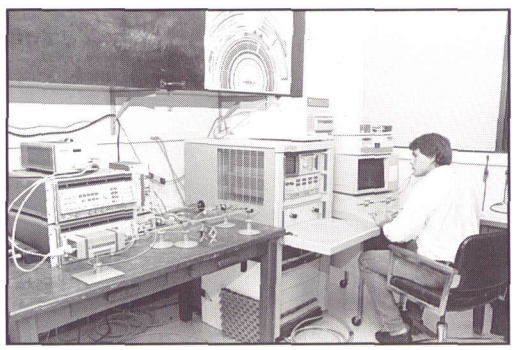
Point of contact: Ms. N.H. Sell, Code 4000A (202) 767-3324

*Additional duty

General Science and Technology Directorate

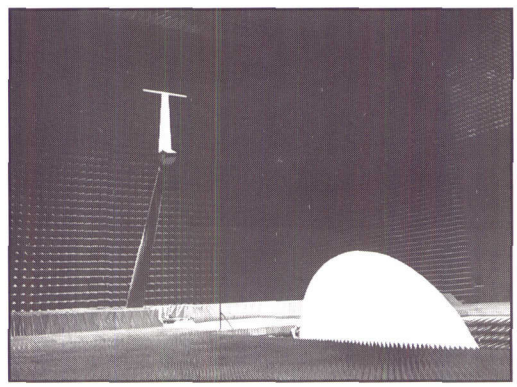
Code 4000

- Technology Assessment
- Technical Program Management
- Low Observables Programs
- Counter Low Observables
- Multidisciplinary Programs
- Modeling of Signatures
- Field Signature Trials
- Low Observables Materials



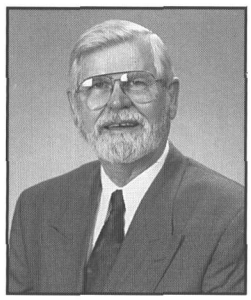
Vector network analysis of new low observables materials

Field signature trials



Infrared signatures

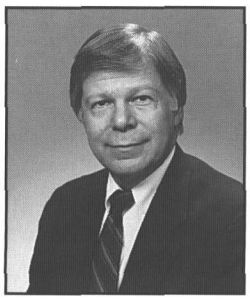
Consultant for Critical Technology Assessment Office
Code 4003



MR. L.M. WINSLOW

The Critical Technology Assessment Office is tasked by the Assistant Secretary of the Navy (RE&S) via the Navy International Program Office to perform a broad spectrum of interrelated Navy mission-oriented efforts pertaining to international militarily critical technology transfer policy and intelligence assessment issues, involving both control and acquisition aspects. These tasks require the identification and participation of highly qualified individuals throughout the Navy scientific and technical community.

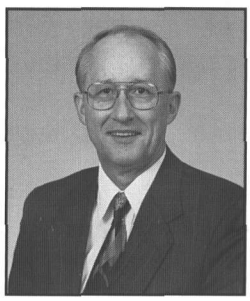
Technology Base/Ballistic Missile Defense Organization (BMDO) Office
Code 4040



DR. S. SACKS

The Technology Base Manager carries out program management activities pertaining to the Navy 6.2 (exploratory development), BMD, SBIR, 6.3 A ATD, DMSO, and other technology efforts. Mission activities include assurance of technical quality and program relevance, orientation of the program to priority needs and transition opportunities, and overall coordination of NRL efforts. The Technology Base Manager is the Laboratory point of contact with the Program Offices for this work.

Signature Technology Office
Code 4050



DR. D.W. FORESTER

The NRL Signature Technology Office (STO) manages/coordinates an integrated, comprehensive research and development program at NRL addressing all aspects of signature control and countersignature control as they apply to Navy weapons systems. The STO monitors and evaluates signature control technology development efforts within government and industry and facilitates the incorporation of advanced signature control technologies into present and future Navy systems. It provides a central point of contact for outside agencies on matters concerning the STO program.

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Warfare Systems and Sensors Research Directorate

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WARFARE SYSTEMS AND SENSORS RESEARCH DIRECTORATE

Code 5000

The Warfare Systems and Sensors Research Directorate performs basic research and development for major generic Navy systems. The emphasis is on radar, electronic warfare, optical sensors and materials, and the integration of these primary sensors by communications and battle management systems. The Directorate conducts an extensive experimental program in the field to support the above activities. Programs in systems simulation, human computer interfaces, artificial intelligence, acoustic transducers, and calibration and standards for underwater acoustic devices are pursued in support of research and development for Navy systems. In addition, the Directorate has responsibility for providing specialized computing and computer networking on a Laboratory-wide basis, and the provision of administrative and technical services to support the Laboratory's mission through the operation of the Technical Information Division.

Associate Director of Research for Warfare Systems and Sensors Research

Dr. R.A. LeFande was born on Staten Island, New York on February 8, 1941. He attended the Brooklyn Technical High School and obtained his undergraduate degree in physics from the University of Rhode Island in 1962. After a brief tour as a telephone equipment engineer with Western Electric Company in New York City, he returned to academic pursuits, earning a Master's degree in physics from the Rutgers University in 1965.

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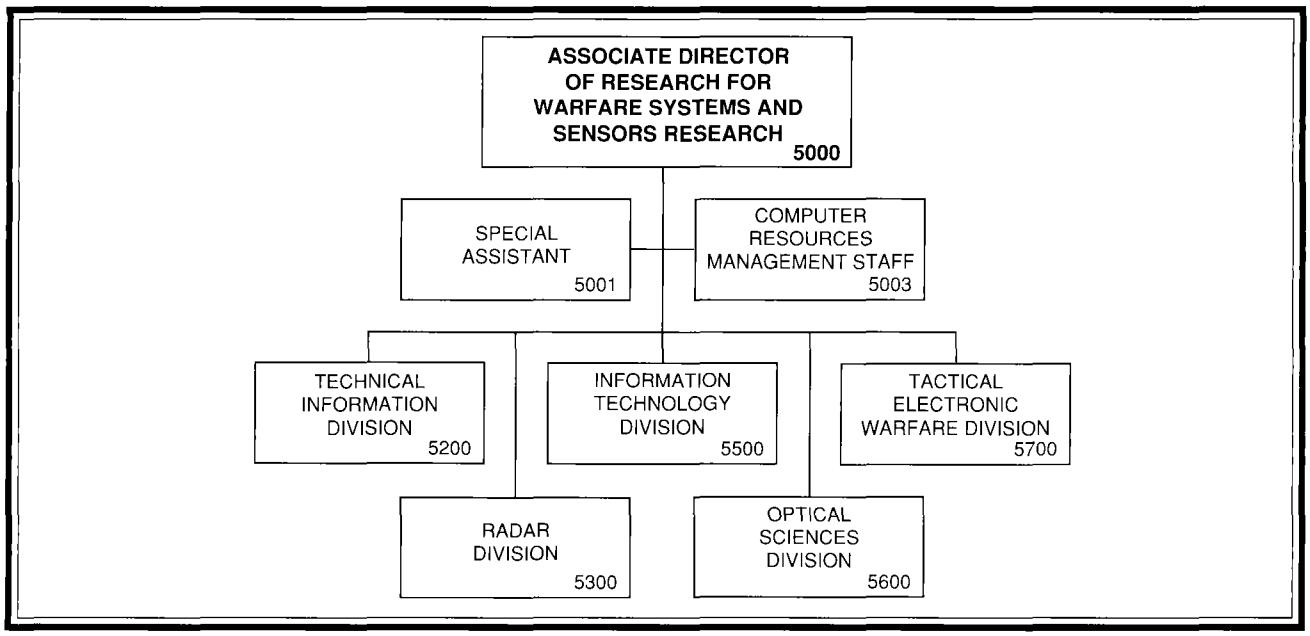


Key Personnel

Name	Title	Code
Dr. R.A. LeFande	Associate Director of Research for Warfare Systems and Sensors Research	5000
Ms. B.J. Turner	Special Assistant	5001
Ms. H.K. Howell*	Head, Computer Resources Management Staff	5003
Mr. P. Imhof	Head, Technical Information Division	5200
Dr. M.I. Skolnik	Superintendent, Radar Division	5300
Dr. R.P. Shumaker	Superintendent, Information Technology Division	5500
Dr. T.G. Giallorenzi	Superintendent, Optical Sciences Division	5600
Dr. J.A. Montgomery	Superintendent, Tactical Electronic Warfare Division	5700

Point of contact: Ms. N.H. Sell, Code 5000A (202) 767-3324

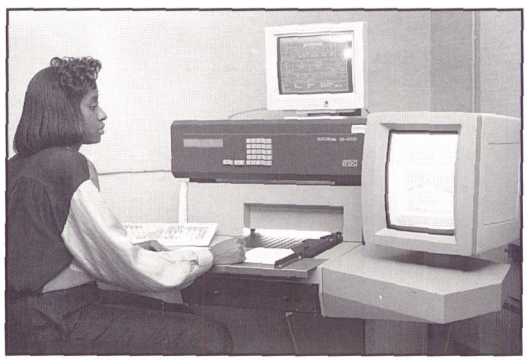
*Acting

Technical Information Division

Code 5200

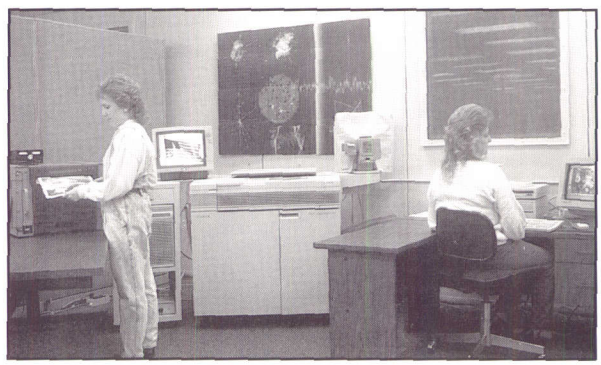
- Research Library and Technical Information Center
- Microcomputer Software Support Center
- Publications
- Photographic Services
- Graphics Design Services

Editors work directly with authors to provide clear, readable documentation



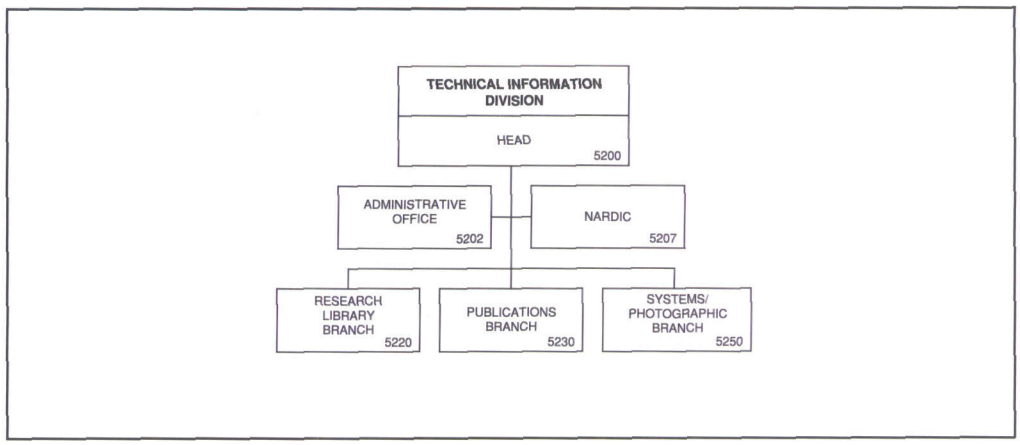
A computer technician scans reports into the Library's Optical Disk System

The Imaginator SI workstation provides a high front-end facility for scanning in and manipulating color photographs for conversion to digital format



Operators in the Electronic Imaging Center print images from the computer network

Mr. P. Imhof



Basic Responsibilities

The Technical Information Division (TID) provides centralized support to the Laboratory, and sometimes the Office of Naval Research, by collecting, retaining, processing, publishing, presenting, and distributing information in various forms to many audiences.

TID supports the Laboratory by editing and publishing reports and publications; by providing a full range of Library services, including the Microcomputer Software Support Center; by performing specialized scientific and general photographic services, illustration and visual aid services, imaging support, scientific composition, special projects graphics and publishing; and by providing photographic and video data-gathering and editing services.

Personnel: 67 full-time civilian

Key Personnel

Name	Title	Code
Mr. P. Imhof	Head	5200
Ms. M.B. Gutierrez	Administrative Officer	5202
Ms. L. Stackpole	Head, Research Library Branch	5220
Mr. T. Calderwood	Head, Publications Branch	5230
Mr. J. Lucas	Head, Systems/Photographic Branch	5250

Point of contact: Ms. M.B. Gutierrez, Code 5202 (202) 767-3370

Radar Division

Code 5300
Staff Activity Areas

Systems research
Electromagnetic propagation
Electromechanical design

Research Activity Areas

Radar Analysis
Radar systems
Target signature prediction
Electromagnetics and antennas

Advanced Radar Systems
High-frequency over-the-horizon radar
Signal analysis
Signal processing and equipment
Computer Aided Design (CAD)

Search Radar
Shipboard surveillance radar
Electromagnetic Compatibility/
Electromagnetic Interference (EMC/EMI)

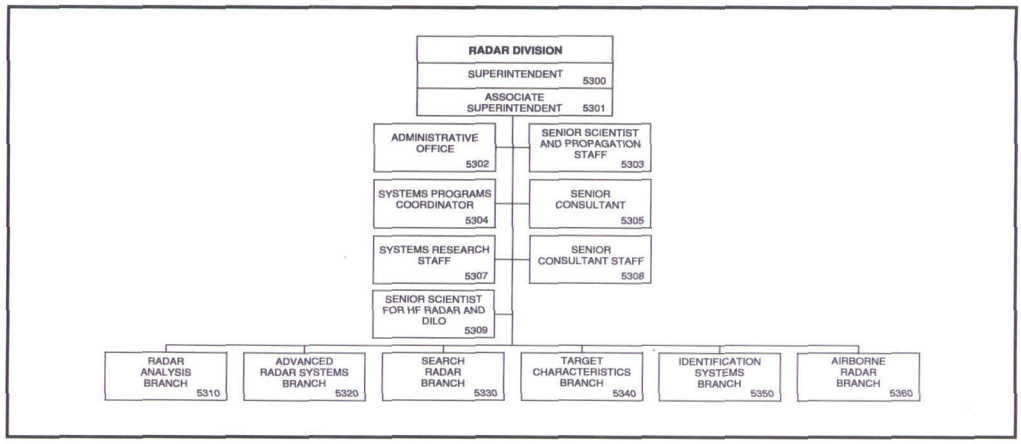
Target Characteristics
Ship self defense
Electronic counter-countermeasures
Target signature recognition

Identification Systems
Combat aircraft identification
Mark XII IFF improvements
Future identification technology

Airborne Radar
Airborne early-warning radar (AEW)
Inverse synthetic aperture radar (ISAR)
Space-time adaptivity

Radar test site at Building 75, Chesapeake Bay Detachment (Chesapeake Beach, MD) showing radar antennas used in experimental development by the Radar Division. On the roof, from left to right: experimental 3D elevation phase scanned antenna for SENRAD, an experimental L-Band system; a directed mirror antenna (DMAR); and antennas for the SPS-49, SPS-10, IFF, SPS-40, and the fixed array surveillance radar (FASR). On the ground from left to right are antennas for: SPQ-9(I) advanced development model (in radome); a high resolution X-band clutter radar; and the high range resolution monopulse (HRRM) system.

DR. M.I. SKOLNIK



Basic Responsibilities

The Radar Division conducts research on basic physical phenomena of importance to radar and related sensors, investigates new engineering techniques applicable to radar, demonstrates the feasibility of new radar concepts and systems, performs related systems analyses and evaluation of radar, and provides special consultative services. The emphasis is on new and advanced concepts and technology in radar and related sensors that are applicable to enhancing the Navy's ability to fulfill its mission.

Personnel: 150 full-time civilian

Key Personnel

Name	Title	Code
Dr. M.I. Skolnik	Superintendent	5300
Dr. G.V. Trunk	Associate Superintendent	5301
Mrs. C. Hill	Administrative Officer	5302
Dr. L.B. Wetzel	Senior Scientist and Head, Propagation Staff	5303
Mr. I.D. Olin	Senior Consultant	5305
Mr. J.M. Headrick	Senior Scientist for HF Radar and DILO	5309
Mr. P.K. Hughes II*	Head, Radar Analysis Branch	5310
Mr. J.P. Letellier	Head, Advanced Radar Systems Branch	5320
Mr. J. Pavco	Head, Search Radar Branch	5330
Dr. B.H. Cantrell	Head, Target Characteristics Branch	5340
Mr. C.M. Veronda	Head, Identification Systems Branch	5350
Mr. T.L. apRhys	Head, Airborne Radar Branch	5360

Point of contact: Dr. G.V. Trunk, Code 5301 (202) 767-2573

*Acting

Information Technology Division

Code 5500
Research Activity Areas

Navy Center for Applied Research in Artificial Intelligence

- Case-based reasoning
- Natural language interfaces
- Intelligent tutoring
- Machine learning
- Robotics software and computer vision
- Neural networks
- Novel interaction techniques
- Devices/techniques for HCI
- Voice processing (synthesis, recognition, transmission, etc.)
- Man-in-loop interface evaluation

Communication Systems

- Network design
- Tactical communication system engineering
- Modulation, coding, and waveform design
- Satellite communication system technology
- Distributed simulation and prototyping

Center for High Assurance Computer Systems

- Security architecture
- Formal specification/verification of system security
- COMSEC application technology
- Secure networks
- Secure databases
- Software engineering for secure systems
- Key management and distribution
- Certification and Infosec Engineering
- Formal methods for requirements specification and verification
- Tools for real-time software development

Transmission Technology

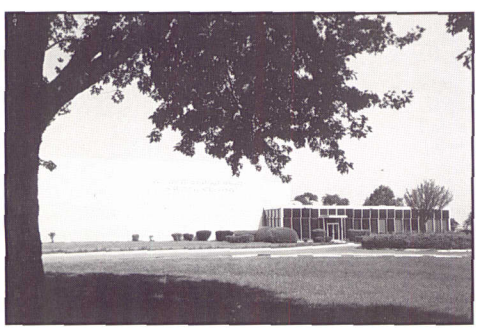
- Arctic communication
- Submarine communication technology
- Communication system architecture
- Communication antenna/propagation technology
- Communications intercept systems
- Signal analysis systems

Advanced Information Technology

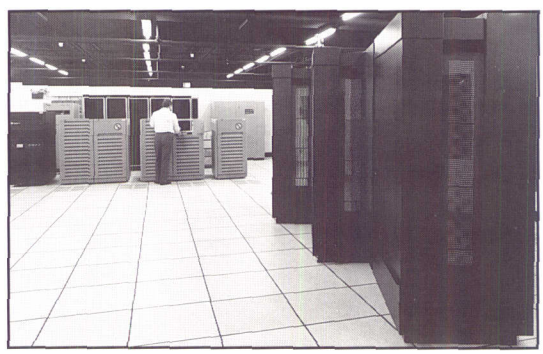
- Command decision support
- Parallel computing
- Battle management/C^3
- Data fusion technology
- Database management technology
- Real-time parallel processing
- Distributed simulation
- Scalable high performance computing
- Processing graph method
- Signal processing applications
- Advanced ATM/SONET networking
- Image processing
- Virtual reality

Center for Computational Science

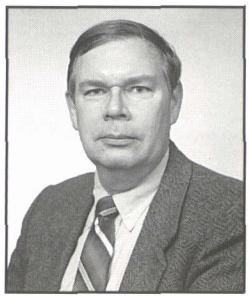
- Network research and design
- Parallel computing
- Scalable high performance computing
- Distributed computing environments
- Scientific visualization



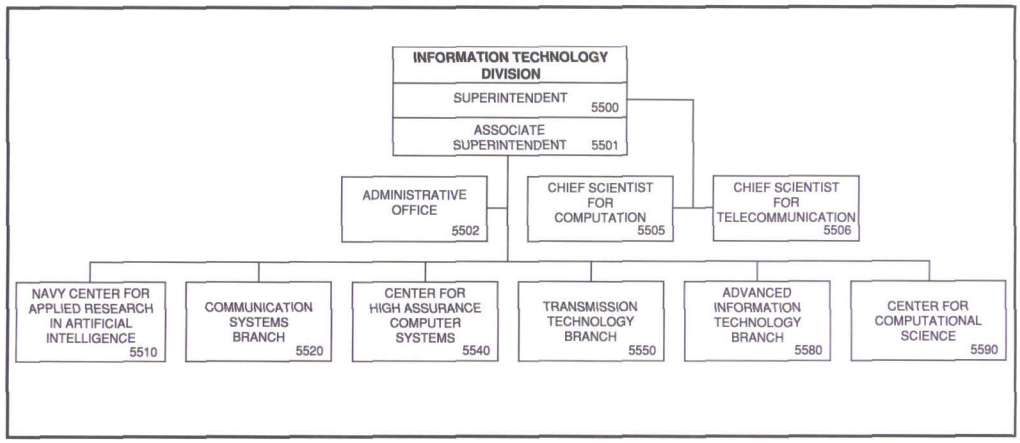
The Navy Center for Applied Research in Artificial Intelligence is engaged in research and development designed to address the application of artificial intelligence technology and techniques to critical Navy and national problems



The Thinking Machines, Inc. CM-5E computer has 256 processor nodes with four-pipe vector units each, 32 gigabytes of memory, 100 gigabytes of disk array storage, and 40 gigaflops/64-bit peak performance



Dr. R.P. Shumaker



Basic Responsibilities

The Information Technology Division conducts research and development programs in the collection, transmission, and processing of information to provide a basis for improving the conduct of military operations. The organization of the Division is directed toward addressing the technologies and subsystems necessary to develop architectures and system designs for the next-generation battleforce warfare systems.

Personnel: 195 full-time civilian

Key Personnel

Name	Title	Code
Dr. R.P. Shumaker	Superintendent	5500
Mr. W.D. Long	Associate Superintendent	5501
Ms. J. Saunders	Administrative Officer	5502
Vacant	Chief Scientist for Computation	5505
Vacant	Chief Scientist for Telecommunication	5506
Dr. A.L. Meyrowitz	Director, Navy Center for Applied Research in Artificial Intelligence	5510
Mr. E.L. Althouse	Head, Communication Systems Branch	5520
Dr. J.D. McLean	Director, Center for High Assurance Computer Systems	5540
Mr. E.J. Kennedy	Head, Transmission Technology Branch	5550
Dr. S.K. Numrich	Head, Advanced Information Technology Branch	5580
Ms. H.K. Howell	Center for Computational Science	5590

Point of contact: Mr. W.D. Long, Code 5501 (202) 767-2954

Optical Sciences Division

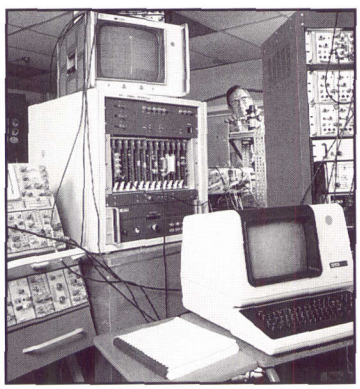
Code 5600
Staff Activity Areas

Program analysis and development
Special systems analysis
Technical study groups
Technical contract monitoring
Theoretical studies

Research Activity Areas

Fiber Optics Technology
Advanced infrared glasses and fibers
Fiber-optic materials and fabrication
Fiber chemical sensors

Optical Physics
Laser materials diagnostics
Nonlinear frequency conversion
Optical instrumentation and probes
Radiation effects
Fiber-optic materials and fabrication
Sensors for smart structures
Fiber lasers and amplifiers
Optical seeker studies
Optical interactions in semiconductor superlattices and organic solids



The Focal Plane Array Evaluation Facility consists of the optical sources and electronics required to evaluate monolithic or hybrid infrared focal plane arrays that use charge-coupled device, charge-injection device, direct readout, or charge-imaging matrix technologies

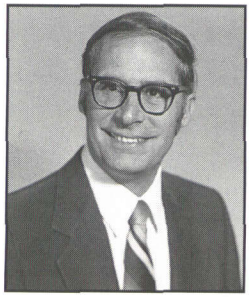
The Missile Seeker Evaluation Facility is a computerized facility that is used to evaluate optical countermeasures to infrared missile seekers and infrared imaging sensors

Applied Optics
Detection signal processing studies
Optical and IR countermeasures
Optical technology
Ultraviolet component development and UV countermeasures
Atmospheric optics
Propagation studies
Laser radar
Optical imager development

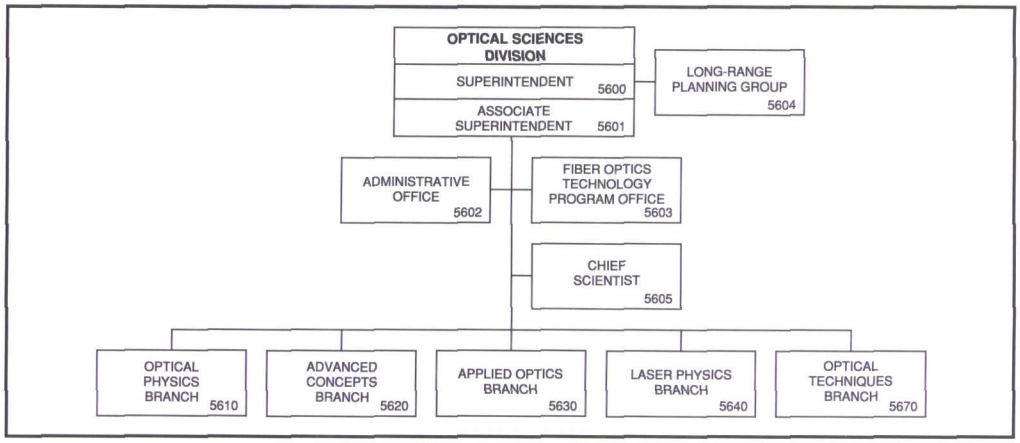
Laser Physics
Molecular and chemical laser physics
Interferometry
Laser chemical kinetics
Diode laser pumped solid-state lasers
Electrically driven lasers
Laser-induced reactions
Nonlinear frequency conversion
Beam cleanup technology
Solid-state laser development

Advanced Concepts
IR low observables
IR space surveillance systems
EO/IR systems analysis
Airborne IR search and track technology
Atmospheric IR measurements
Ship IR signatures
High-speed optical networks

Optical Techniques
Diode laser applications
Fiber lasers/sources
Optical control of solid-state electronic devices
Integrated optics
Fiber-optic sensors (acoustic, magnetic, electric fields, etc.)
Tunable and short (<100 femto-seconds) optical pulses for high-speed probing of semiconductor materials, superconductors, and other materials
High-power laser diode amplifier



DR. T.G. GIALLORENZI



Basic Responsibilities

The Optical Sciences Division carries out a variety of research, development, and application-oriented activities in the generation, propagation, detection, and use of radiation in the wavelength region between near-ultraviolet and far-infrared wavelengths. The research, both theoretical and experimental, is concerned with discovering and understanding the basic physical principles and mechanisms involved in optical devices, materials, and phenomena. The development effort is aimed at extending this understanding in the direction of device engineering and advanced operational techniques. The applications activities include systems analysis, prototype system development, and exploitation of R&D results for the solution of optically related military problems. In addition to its internal program activities, the Division serves the Laboratory specifically and the Navy generally as a consulting body of experts in optical sciences. The work in the Division includes studies in quantum optics, laser physics, optical waveguide technologies, laser-matter interactions, atmospheric propagation, optical technology, holography, optical warfare, optical data processing, fiber-optic sensor systems, optical systems, optical materials, radiation damage studies, IR surveillance and missile seeker technologies, IR signature measurements, optical recording materials, and optical diagnostic techniques. A significant portion of the effort is devoted to developing, analyzing, and using special optical materials. Various field measurement programs on optical problems of specific interest are also conducted.

Personnel: 137 full-time civilian

Key Personnel

Name	Title	Code
Dr. T.G. Giallorenzi	Superintendent	5600
Mr. J.M. McMahon*	Associate Superintendent	5601
Ms. V. Short-Williams	Administrative Officer	5602
Mr. G. Cogdell	Head, Fiber Optics Technology Program Office	5603
Dr. M. Kruer	Long-Range Planning Group	5604
Dr. R.A. Patten	Long-Range Planning Group	5604
Dr. L. Esterowitz	Chief Scientist	5605
Dr. A.J. Campillo	Head, Optical Physics Branch	5610
Dr. J.C. Kershenstein	Head, Advanced Concepts Branch	5620
Dr. R.A. Patten	Head, Applied Optics Branch	5630
Dr. B. Feldman	Head, Laser Physics Branch	5640
Dr. J. Weller	Head, Optical Techniques Branch	5670

Point of contact: Ms. V. Short-Williams, Code 5602 (202) 767-2855

*Acting

Tactical Electronic Warfare Division

Code 5700
Staff Activity Areas

EW strategic planning
Information Warfare Technology Program
EW lead laboratory coordinator
Communications CM group
Effectiveness of Naval EW Systems (ENEWS)
Facility operations unit

Research Activity Areas

Offboard Countermeasures
Expendable technology and devices
Unmanned air vehicles
Offboard payloads
Decoys

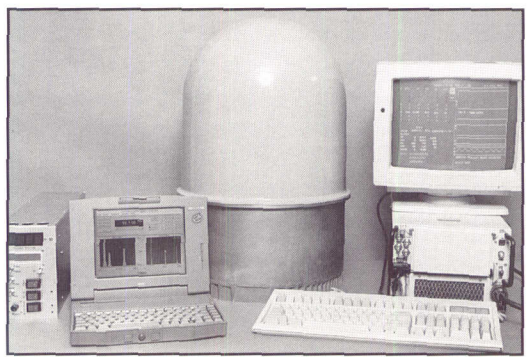
Airborne Electronic Warfare Systems
Air systems development
Penetration aids
Power source development
Jamming and deception
Millimeter-wave technology

Ships Electronic Warfare Systems
Ships systems development
Jamming technology
Deception techniques
EW antennas

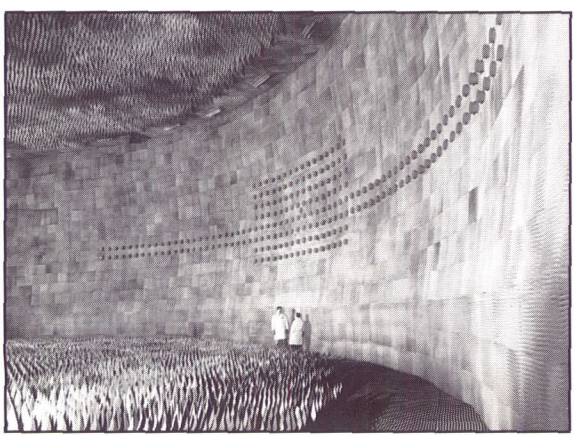
Electronic Warfare Support Measures
Intercept systems and direction finders
RF signal simulators
Systems integration
Command and control interfaces
Signal processing

Advanced Techniques
Analysis and modeling simulation
New EW techniques
Experimental systems
EW concepts
Infrared technology

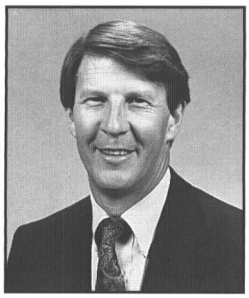
Integrated EW Simulation
Hardware-in-the-loop simulation
Data management technology
Flyable ASM seeker simulators
Foreign military equipment exploitation



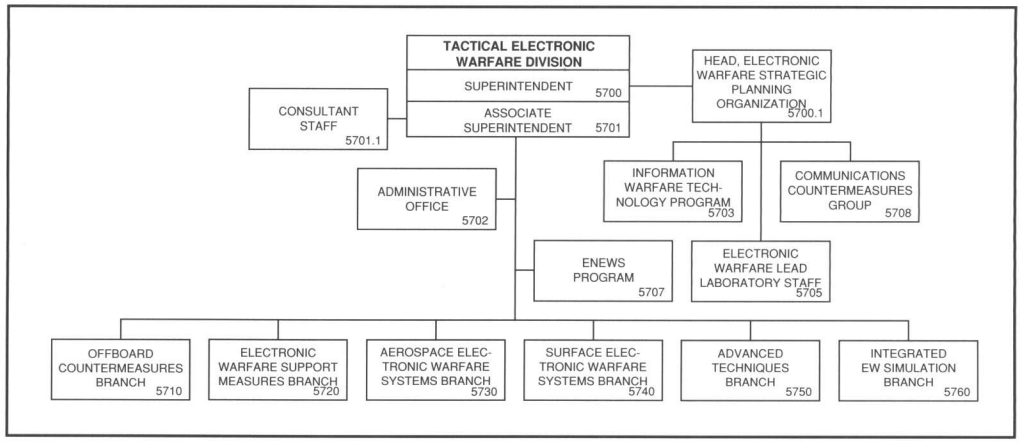
Using the latest composite, MIMIC and processing technologies, the Tactical Electronic Warfare Division has developed a small, lightweight, and inexpensive ESM receiving system for use on frigates, Coast Guard vessels, and various patrol aircraft



The Central Target Simulator (CTS) Programmable Array is part of a large hardware-in-the-loop simulation facility whose purpose is to test and evaluate electronic warfare systems and techniques used to counter the radar guided missile threat to Navy forces



DR. J.A. MONTGOMERY



Basic Responsibilities

The Tactical Electronic Warfare Division (TEWD) is responsible for research and development in support of the Navy's tactical electronic warfare requirements and missions. These include electronic warfare support measures, electronic countermeasures, and supporting counter-countermeasures, as well as studies, analyses, and simulations for determining and improving the effectiveness of these systems.

Personnel: 272 full-time civilian

Key Personnel

Name	Title	Code
Dr. J.A. Montgomery	Superintendent	5700
Dr. C.H. Heider	Head, Electronic Warfare Strategic Planning Organization	5700.1
Mr. H.W. Zwack	Associate Superintendent/Head	5701
Ms. J.C. Johnson*	Administrative Officer	5702
Mr. T. Jones	Manager, Information Warfare Technology Program	5703
Mr. T.J. Jesswein	Head, Electronic Warfare Lead Laboratory Staff	5705
Dr. A.N. Duckworth	Manager, ENEWS Program	5707
Mr. W.W. Everett	Head, Communications Countermeasures Group	5708
Dr. F.J. Klemm	Head, Offboard Countermeasures Branch	5710
Mr. R.D. Oxley*	Head, Electronic Warfare Support Measures Branch	5720
Dr. C.H. Heider*	Head, Aerospace Electronic Warfare Systems Branch	5730
Dr. J.P. Lawrence	Head, Surface Electronic Warfare Systems Branch	5740
Dr. G.E. Friedman	Head, Advanced Techniques Branch	5750
Mr. A.A. DiMattesa	Head, Integrated EW Simulation Branch	5760

Point of contact: Mr. H.W. Zwack, Code 5701 (202) 767-3622

*Acting

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Materials Science and Component Technology Directorate

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MATERIALS SCIENCE AND COMPONENT TECHNOLOGY DIRECTORATE

Code 6000

The Materials Science and Component Technology Directorate carries out a multidisciplinary research program whose objectives are the discovery and exploitation of new improved materials, the generation of new concepts associated with materials behavior, and the development of advanced components based on these new and improved materials and concepts. Theoretical and experimental research is carried out to determine the scientific origins of materials behavior and to develop procedures for modifying these materials to meet important naval needs for advanced platforms, electronics, sensors, and photonics. The program includes investigations of a broad spectrum of materials including insulators, semiconductors, superconductors, metals and alloys, optical materials, polymers, plastics, and artificially structured bio/molecular materials and composites, which are used in important naval devices, components, and systems. New techniques are developed for producing, processing, and fabricating these materials for crucial naval applications.

The synthesis, processing, properties, and limits of performance of these materials in natural or radiation environments, components under deleterious conditions such as those associated with the marine environment, neutron or directed energy beam irradiation, or extreme temperatures and pressures, are established.

Additionally, major thrusts are directed in advanced space sensing, reactive flow physics, computational physics, and plasma sciences. Areas of particular emphasis include fluid mechanics and hydrodynamics, nuclear weapon effects simulations, high-energy density storage devices, interactions of various types of radiation with matter, survivability of materials and components, and directed energy devices.